

Railway Age Gazette

Including the Railroad Gazette and the Railway Age

PUBLISHED EVERY FRIDAY AND DAILY EIGHT TIMES IN JUNE, BY
THE RAILROAD GAZETTE (Inc.), 83 FULTON ST., NEW YORK.

CHICAGO: 417 South Dearborn St. CLEVELAND: New England Bldg.
LONDON: Queen Anne's Chambers, Westminster.

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Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free:

United States and Mexico.....	\$5.00
Canada	6.00
Foreign Countries (excepting daily editions).....	8.00
Single Copies	15 cents each

Engineering and Maintenance of Way Edition and the four Maintenance of Way Convention Daily issues, North America, \$1.00; foreign, \$2.00.

Entered at the Post Office at New York, N. Y., as mail matter of the second class.

VOLUME 52.

JANUARY 5, 1912.

NUMBER 1.

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GENERAL NEWS SECTION.....

IN his article describing railway funded indebtedness, Professor Ripley illustrates his points by citing numerous specific instances. This adds interest to the discussion of general principles, but it is fair to point out that the instances selected are *notable* instances, and frequently exceptions to the rule. In the hundreds of millions of bonds sold each year by the railway companies, all classes of securities are represented, because, of course, of the varying problems that have to be met by the financial officers of the different companies, and in the great majority of cases the financing is carried through very successfully. Professor Ripley takes pains to point out that when he cites a particular case it is not necessarily a typical case, but is often an extreme case illustrative of what a certain kind of financing

may lead to. Nevertheless, it is well to call especial attention to this when we publish the first of Professor Ripley's articles in this week's issue of the *Railway Age Gazette*. One thing further may be mentioned: Professor Ripley condemns certain forms of financing or finds them less desirable than certain other forms. This may be good theory, but in practice the thing that should be done is the thing that can be done. A railway's board of directors are given a specific problem which they *must* solve. They may solve this skillfully by the issue of a certain kind of securities, or clumsily by the issue of a certain other kind of securities, but the success or non-success of their efforts should be judged from practical, not theoretical, standpoints.

THE reduction from a 4 to a 3½ per cent. rate of interest by a good many savings banks, notably in New York City, without doubt is directly related in a measure to railway bond investment. The financial strength of a savings bank depends mainly on three classes of securities: railway bonds, municipal and state bonds, and notes secured by realty mortgages. The last may be described as constants and reckoned at neither above nor below face value so long as they are sound, as they usually are. But the other two are variants depending on market values, and the actual surplus of a savings bank rests on those values and whether they go up or down. At the present time, in the case of the savings banks, we are witnessing an anomalous situation. Municipal, railway and state bonds are selling low, that is to say, giving a high investment return. The state of Connecticut, for a recent example, has just marketed \$4,000,000 non-taxable 4 per cent.'s at a little above par, while a few years ago her 3½ per cent.'s commanded about the same price. As regards *present* investment, therefore, the Eastern savings banks can secure a higher return than in past years, and to that extent are better able to maintain the old 4 per cent. interest rate. But it is far from making good the bond shrinkage of the recent years, that impairs a surplus based on market values. When we look back on the causes of that shrinkage there can hardly be a doubt that it is to be ascribed originally to the lowered market value of the "good" railway bond, and that, in time, to adverse state and federal action. The good railway bond fell and has brought down with it the municipal and state bonds which, along with railway bonds, the banks hold as security for their deposits. The assault on railway credit has hit public credit too; and not only that but, still proceeding, has hit the savings bank depositor, reducing his dividend one-eighth, or 12.66 per cent. It is not the so-called capitalist alone whom a misguided governmental policy affects; the wage earner when he takes his deposit book to be written up has occasion now to learn that he is a capitalist also—and, in an indirect way, a railway capitalist.

SOME three months ago (September 1, 1911) we gave returns of the Interstate Commerce Commission showing, since 1901, the sustaining power of railway passenger traffic and its relative increase as compared with freight traffic. Since then an interesting table has been compiled for forty-two important railways, by T. A. Polley, tax commissioner of the Chicago, St. Paul, Minneapolis & Omaha, which brings many of the returns down to the current year. Taking his returns for a five-year period ending in 1910, the average annual increase for freight business was 4.63 per cent., as compared with 5.15 per cent. for passengers. In a general way, and with one or two decided exceptions, his later table, which in most cases includes the figures for 1911, indicates a tendency of lines of high intensive freight business to increase that form of traffic, while lines of high passenger intensity do not show a corresponding passenger increase. It seems, therefore, as though the proverb of "making the meat one feeds on" reverses itself in the transfer from freight to passengers. This seems somewhat anomalous when it is remembered that passenger density in a great degree depends on city and suburban traffic, and that the American city grows fast

while the rural districts grow slowly. On the other hand, it is to be recalled that two forces—the automobile and the long distance telephone—which have a tendency to reduce passenger traffic, have worked most actively among urban populations, and even the competition of electric railways, especially to suburban points, has not been quite exhausted. Again, there is probably on low passenger density lines an effort to make good in that direction. At any rate, it is from such lines that the sustaining power of passenger business, taking the railway companies as a whole, appears to have been derived, contrary to the natural inference. On some lines like the Seaboard Air Line, the St. Louis & San Francisco, the Soo and the Great Northern, which are at the foot of the list in absolute passenger density, the percentage increase is highest.

THE comments of the Interstate Commerce Commission in its annual report on the decisions of the Commerce Court in the various cases that have been appealed to it from the commission cannot be regarded otherwise than as a direct attack on the court's intelligence and fairness. The commission contends vigorously that several of the court's decisions are not good law. Its principal complaint, however, seems to be that both the Commerce Court and the Supreme Court have been reviewing its findings of fact. Of course, if, as the commission implies, the Commerce Court does not know the law and should not be allowed to review the commission's findings in fact, the Commerce Court has little excuse for its existence. However, that the commission attacks also the decisions of the Supreme Court in certain cases seems to indicate that its grievance is not merely against the Commerce Court, but grows out of its idea that it (the commission) has a very comprehensive authority, indeed. Its position seems to be that when an appeal is taken from one of its orders affecting rates the courts have no right to set it aside unless it be shown to be confiscatory. On this theory it might make a rate of \$15 from Chicago to Omaha and one of 15 cents on the same commodity from Chicago to San Francisco, and nobody would have any right to interfere except Congress, unless it were not shown that the result was to confiscate the railways concerned. But such an adjustment would be unreasonable, and the law as made by Congress requires railway rates to be *reasonable* and merely empowers the commission to fix *reasonable* maximum rates. If the commission chooses to disregard the expressed will of Congress that the rates it fixes shall be reasonable, have those injured no recourse except to appeal for further legislation by Congress to change the rates fixed by the commission? If the commission is to be a law unto itself why require the rates it fixes to be reasonable? That Congress meant *all* the orders of the commission to be subject to review by the courts is implied by the language of the law itself and is a matter of historic record; and the courts in reviewing them are merely carrying out the will of Congress. That most of the decisions of the court have reversed the commission is just what might be expected; for the railways only appeal from the comparatively small minority of the commission's decisions against them which they are pretty sure they can get reversed. It is a matter of record that, for similar reasons, the commission was continually reversed by the courts before the Commerce Court was established; and for similar reasons it would continue to be if that court were abolished. No doubt the Commerce Court could present some pretty pertinent facts and cogent reasoning in its defense, if it were not contrary to custom and good form for courts to do such things. That the commission knew it was attacking a body that could not talk back does not put its assault in a more favorable light.

ONE of the best evidences of the arrival of the mechanical stoker for locomotive work and its acceptance as an accomplished fact, is to be found in an improvement of one of the stokers on the market, as described in another column. The old

idea that the stoker must be prepared for the coal and be so constructed as to handle everything from dust to large lump, in all classes of services and on all kinds of locomotives, has been abandoned. In its stead has come the acceptance of the condition that the coal should be prepared for the stoker. This is a simple thing in itself, but really means more than it seems. It means that we have abandoned the old requirements that we are accustomed to put on every new device that is presented for acceptance, which require that it shall do far more than we ever dreamed of doing in the old way, and shall do it so smoothly and with such a total absence of trouble that cost of maintenance shall be nil, and the veriest fool cannot harm it. Instead, we recognize it as a machine with its own physical limitations, and as a thoroughly efficient and economical one within these limitations. Instead of saying: "If it can't handle run of mine coal, it will never do." We say: "If the stoker is to do good work, the coal must be fitted for it." And so the stoker manufacturers are to be congratulated on the breaking down of this really formidable barrier to their progress and the recognition of the necessity for crushing coal before it is put on the tenders of locomotives equipped with mechanical stokers. This done, the introduction will be more rapid and the crusher at the coaling station and the stoker on the locomotive will form a combination that will be taken as much as a matter of course as a dryer for the sand, and the box that holds it on top of the boiler. It has been a very long and hard struggle to gain this point, and as it is a crucial one, one on which the success of the mechanical stoker really depends, and one that has been urged upon deaf ears for a long time and seemingly to no avail, the fact that it has been accepted by one progressive road cannot be too strongly emphasized.

THE "RULE OF REASON" AND THE RAILWAYS.

IN the light of the recent Supreme Court decisions in the Standard Oil and the Tobacco cases, an interesting question arises as to the position which the railways now occupy and how far they are now legally permitted to go in the direction of co-operative action. President Taft has expressed clearly his opinion of these decisions, and his view of the law as it stands today. Because of his training and experience upon judicial questions, his attitude carries more weight than does the opinion usually of our chief executive. Upon questions that relate to combinations and restraint of trade, his views have the prestige that comes from the fact that he delivered the Circuit Court of Appeals opinion in the Addyston Pipe & Steel Company case, which was upheld in every respect by a unanimous decision of the court of last resort. President Taft, in his message to Congress, declares that these recent decisions are epoch-making and that they serve to advise the business world authoritatively as to the scope and the operation of the Sherman Anti-trust act.

Now, what advice do they give to the railway managements? The Trans-Missouri Freight Association case, which dissolved that organization as being a combination in restraint of trade and in violation of the Anti-trust act, was decided in March, 1897. This organization had been created according to its expressed intent "for the purpose of mutual protection by establishing and maintaining reasonable rates, rules and regulations on all freight traffic." The majority of the court, disregarding the mass of authoritative and undisputed fact showing the disastrous results of unrestrained competition of paralleling lines, held that the act covered all restraints, whether reasonable or unreasonable. Said the Court: "It may be that the policy evidenced by the passage of the Act itself will, if carried out, result in disaster to the roads, and in a failure to secure the advantages sought from such legislation. Whether that will be the result or not we do not know and cannot predict. These considerations are, however, not for us." This opinion was rendered by Justice Peckham and concurred in by only four other justices. The opinion in the

Joint Traffic case a year later was rendered by the same justice on the same grounds, with the same four justices concurring. Of these four, Justice Brewer, five years later in the Northern Securities case, rendered a separate opinion for the express purpose of announcing his change of attitude. He said, "Instead of holding that the Anti-trust Act included all contracts, reasonable or unreasonable, the ruling (in the Trans-Missouri and Joint Traffic cases) should have been that the contracts there presented were unreasonable restraints of interstate trade, and *as such within the scope of the act.*"

Moreover, in the able dissenting opinion in the Trans-Missouri case delivered by Justice White, the present Chief Justice, and concurred in by Justices Field, Gray and Shiras, in which it is pointed out that the contract between the railway companies substantially embodies only an agreement to obtain uniform classification, avoid rate cutting, and arbitrary and sudden changes in rates, occurs this significant sentence: "*The opinion of the court rests upon the hypothesis that the provisions of the contract are reasonable,*" and again, "*It is conceded that the contract does not unreasonably restrain trade.*" In other words, the traffic associations were condemned not because they were in unreasonable restraint of trade (for the opinion of the Court assumed their reasonableness), but because the act of Congress forbade all restraints.

We now come to the Standard Oil and Tobacco decisions in which the opinions of the Court, unanimous except for a disagreement upon one point by Justice Harlan, were delivered by Chief Justice White, who was the leader in dissent in the Traffic cases. With seven concurring justices, he declares that the Anti-trust Act indubitably requires a standard, and that it was intended by the act that the standard of reason should be applied, a position which is strikingly confirmed by former Senator Edmunds in his article in the *North American Review* for December.

If, then, a practically unanimous Court has declared in so emphatic a way that only unreasonable restraints are illegal, a position which the majority of the Court have unquestionably maintained since the Northern Securities decision in 1903, where does this situation leave the railways in respect to the right to form traffic associations? No better answer can be given than to quote a sentence from the opinion of the Chief Justice in the Tobacco case:

"The necessity for not departing in this case from the standard of the rule of reason which is universal in its application is so plainly required in order to give effect to the remedial purposes which the act under consideration contemplates, and to prevent that act from destroying all liberty of contract and all substantial right to trade, and *thus causing the act to be at war with itself by annihilating the fundamental right of freedom to trade, which on the very face of the act it was enacted to preserve,* is illustrated by the record before us."

The railway traffic association, while it restrained competition, never in the remotest degree restrained trade unreasonably. It conferred enormous benefits upon business by promoting stability and guarding against arbitrary fluctuations in rates. It never suggested monopoly in any sense except to the anti-railroad crusader. It preserved that "fundamental right of freedom to trade" which the Sherman Anti-trust act was "enacted to preserve."

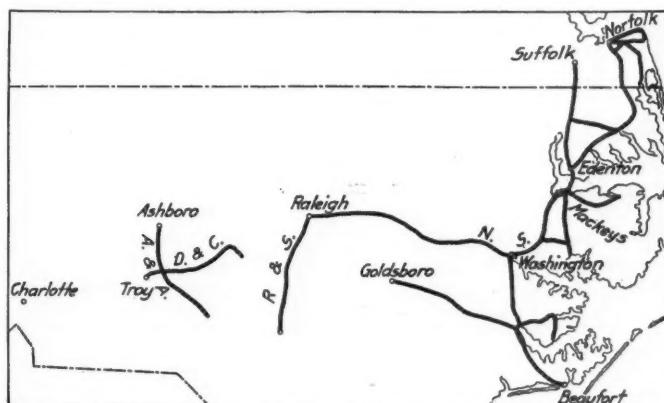
It is well known that after the Trans-Missouri and Joint Traffic Association decisions the various traffic associations were reorganized, but in such a way as was intended to conform, at least technically, with the decisions. No one has ever been certain, however, whether as reorganized they are legal and the fear of prosecution has prevented the railways from making them as effective, beneficial and public means of co-operation regarding traffic matters as it is desirable they should be. Have not the recent decisions under the anti-trust law cleared away all doubt of their legality and all obstructions to their restoration to a basis where they will be as effective organizations as they ought to be?

A POSSIBLE NEW COMPETITOR IN THE SOUTH.

THE large railway systems of the Southeast have been built up in good part by a system of buying and connecting up short lines, but big southern railway companies are not now, to any great extent, adding to their mileage by buying short lines. One can sit down with a railway map of the southern states and plan out quite a number of railway systems that could be made by connecting up short lines now in operation; and on paper these combinations often look attractive. Apparently, however, most of the important southern railway companies have come to the conclusion that in practice this is not profitable.

The Norfolk Southern is the new company that took over the Norfolk & Southern after the receivership and foreclosure sale under plan of reorganization, which sale took place in 1910. This company has begun a policy of expansion that might, if carried very far, be an attempt at building up a new railway system by connecting existing short lines. The Norfolk Southern itself is a sound, compact, small property that operates about 608 miles, of which the main line and the two important branches are shown in the accompanying sketch map. Its operating revenues in 1911 totaled \$2,960,000, and after the payment of expenses, taxes and fixed charges, the company had a surplus of \$610,000, from which it paid \$240,000 dividends.

There is no competing railway between the main north and south line from Norfolk to Beaufort and the coast. A large part of the company's business is carrying lumber, and it owns all



The Norfolk Southern and Its Three New Lines.

of the securities of the John L. Roper Lumber Company. The railway competes only to a limited extent with the Southern Railway and the Seaboard Air Line, and the company has a tidy and, probably, profitable property which may well be expected to develop a considerably larger business than it is now doing. The development of the country through which the road runs is rapid, and, as the timber is cut off, the land, which is unusually fertile, can be put under cultivation and made to produce profitable crops at a minimum cost.

It was recently announced that the Norfolk Southern had bought control of the Aberdeen & Ashboro, the Durham & Charlotte and the Raleigh & Southport. There was also recently incorporated, as mentioned in our construction news columns, the Raleigh, Charlotte & Southern, and it is understood that Norfolk Southern interests are behind and intend to help finance this Raleigh, Charlotte & Southern.

Details of the proposed route of the R. C. & S. have not probably been fully worked out even by those interested, but in the main their plans indicate an intention of having a line controlled by the Norfolk Southern running from Raleigh at least as far southwest as Charlotte, of which line the detached east and west line, shown in our sketch map marked D. & C., would form the middle section. Such a line would parallel the Seaboard Air Line from Raleigh to a point south of the terminus of the D. & C., as shown on the map, and would compete with the Southern Railway and the Seaboard Air Line for business from Charlotte.

If the Norfolk Southern stopped at Charlotte, the competition on the 150-mile extension from Raleigh might well not be keen enough to make its operation unprofitable. If the Norfolk Southern, however, extended much further into Southern Railway territory, it might be within the bounds of possibility that competition would become unprofitably keen. It is not intended to assume here that the Norfolk Southern has any more ambitious plans than the extension to Charlotte, but it is quite interesting to speculate on what the results of such an extension might possibly be. In the South, more than in any other part of the country, a situation may exist in which short, independent roads not connected with each other but connecting with lines of the larger systems may well be operated at a fair profit, and yet if they were to be connected up with each other, formed into a system and brought into competition with the big roads to which they had heretofore been feeders, one might well find that they could no longer handle their business on a profitable basis.

The Norfolk Southern itself handles as we have said a large tonnage of lumber—more than half of the total tonnage last year was furnished by lumber and lumber products—but its ton mile rate is quite high. This is one of the factors that permits it to operate at a low ratio. This low operating ratio is essential.

The Southeast is developing more rapidly in many ways than any other section of the country. The country is covered with a network of railways, most of which, with the exception of a few great main lines, are cheaply built and capable of carrying only comparatively light traffic for which, to handle on a profit basis, they must charge a high ton-mile rate. Notwithstanding, however, the large proportionate mileage of branch lines and light railways, the country has by no means as yet grown up to its railway facilities. On the Southern Railway it is probable that traffic could be increased five or six times on hundreds and hundreds of miles of branch lines without increasing the facilities of these lines with the exception of rolling stock. This is even more true of a considerable number of independent short lines. These short lines now make more or less of a living because they are local enterprises, but were they brought together and made part of a large system, competing with the older lines and no longer local businesses but foreign corporations with a capital C, they might well find it impossible to earn even their fixed charges.

NEW BOOKS.

The Mechanical World Pocket Diary and Year Book for 1912. Emmott & Co., Manchester, England. Cloth, 4 in. x 6 in., 263 pages. Price, 12 cents.

The twenty-fifth annual edition of this publication appears promptly, and with some improvement over previous issues. The section on steam turbines has been rewritten and extended considerably, with new illustrations. There are new sections dealing with roller bearings, helical springs and milling cutters, and a number of new tables. The book is more fully illustrated than formerly, and the whole work has been subject to a thorough revision.

Technology and Industrial Efficiency. Published by the McGraw-Hill Book Company, New York. 6 in. x 9½ in. 486 pages. Bound in cloth. Price, \$3.00.

This volume contains the proceedings of the Congress of Technology, held in Boston, Mass., last April at the Massachusetts Institute of Technology. Some seventy papers are included which form a valuable and up-to-date record of the present state of industrial science, including the presentation of some of its problems and probable solutions. The six sections into which the congress was divided are represented by papers on: Scientific Investigation and Control of Industrial Processes, Technological Education and its Relation to Industrial Development, Administration and Management, Recent Industrial Development, Public Health and Sanitation, and Architecture. These divisions are logical and comprehensive.

Letters to the Editor.

A YARDMASTER'S VIEWS ON EFFICIENCY.

PITTSBURGH, Pa., November 29, 1911.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Mr. Ballantine's paper entitled "Locomotive Efficiency and Condition Reports" which appeared in your paper October 27 strikes me as retrogressive. It did seem a short time ago that the railways had gone statistically mad, but the present tendency is to railroad more in the present and less in the past.

If the government regulating experts and scientific management experts would give real railway men of the type of Atterbury, Kruttschmitt and Hine a chance they might yet save the valuable properties which our too zealous critics seem bent on destroying. Let us grant that old business methods were not all they should have been, and publicity and agitation were necessary. Would it not be well to cease the agitation for awhile? The men as well as the customs of the old days are gone. Give the new men a chance. Prosecutions for real wrong and persecutions as a hobby are quite different.

Brandies and Emerson, with their irresponsible \$1,000,000-a-day talks, do not attempt to show where the waste is, or how it can be corrected. This \$1,000,000 a day seems an enormous sum, but is it? Figures are only comparative, and does \$1,000,000 a day waste represent more than 10 per cent. of the gross income? Is it possible to operate any corporation or even household with less than 10 per cent. waste? In fact, would it not be painful to be keyed up to 100 per cent. efficiency in all our actions? The gross earnings of all the railways in the United States for the last fiscal year were \$2,787,266,136. Ten per cent. of this is \$278,726,614, or \$763,635 a day. Ninety per cent. efficiency means, then, \$763,835 a day waste. Odd figures do not make an attractive headline, so the more attractive figure of \$1,000,000 a day waste was given. Analysis really shows this statement to be an estimate. Ninety per cent. is considered a good average in anything. If the statement had been that the railways were wasting 20 per cent. of the gross earnings, and that at least 10 per cent. of this should be saved, it might not have made such an attractive headline, but it would have been more logical.

Before we abandon this efficiency-statistical craze it would be interesting to have figures showing the cost of productive and non-productive labor on the railways. It would not be surprising to find the latter near the 50 per cent. mark. What is the answer? Too much so-called efficiency.

After all, what do these lawyers and engineer enthusiasts know about railway operation. We admit that the educated man who enters the railway service and makes an honest study of the intricate railway problems should make a better railway man than the one lacking education. We do not admit, however, that the man who has taken a railway course in some school can tell us anything about railway operation.

The Pennsylvania and Harriman Lines have railway schools (apprentice courses) that have been turning out real efficiency men for years.

Shop supervision is more simple than operating supervision. The railway people know this, however, and are trying to get effective supervision closer to the actual operation. The unit system now in operation on the Harriman Lines is a practical step in this direction.

This lack of on-the-ground supervision represents phenomenal traffic growth instead of inefficient management. The organization which a few years ago gave us on-the-ground supervision has grown with the traffic, until the superintendent of today has almost as much traffic and as many men to look after as the general manager of a few years ago. What is needed, and what is coming, is reorganization below the position of superintendent, which will give this on-the-ground supervision.

To get back to Mr. Ballantine's paper. The railways have discovered that efficiency and statistics can be overworked, and they are trying to get away from the unpractical. While the politicians and efficiency men think they have discovered something new, and are calling for all kinds of statistics, the railways have learned that what is needed is fewer post-mortems and more action. Dwell less on what was done yesterday and get on the job today, and there will be less concern about the net earnings showing up on the wrong side of the ledger. Conductors, roundhouse foremen and yardmasters already make too many reports that are at best only good estimates. When an emergency arises we find the reports did not give the picture as had been intended. We then fall back on the expert explainer. He discovers some new factor that has thrown our machinery out of gear. The evil is not corrected, but the excuse lets us out temporarily.

We have a board of uniform cost, but we find uniformity of cost is more apt to run to the maximum than to the minimum.

We have a store department, which apportions supplies to all departments. One department has been fortunate, not using all its supplies, but to provide for a rainy day the full allotment for the next period is drawn. It might be necessary to bury some bridge stone, or rails, or perhaps resort to the scrap pile, so the inspector will not catch us with a surplus, but the labor necessary to do this also being allotted, the expense will not show up against us.

The serious nature, however, of the allotment evil is for the chap who has had to use his allotment. For example, each roundhouse is allotted a certain number of engine parts. The roundhouse manages by patch jobs, etc., to keep the engines going, but some foreman less fortunate than the others will have the same part on several engines to give way entirely, and his whole allotment is gone in a few days. He makes requisition for an additional supply. After much correspondence and grilling by a chief clerk, or a storekeeper who has been a chief clerk, his mechanical knowledge being nil, the much needed parts are furnished. In the meantime, each engine that comes to the house for running repairs is robbed of the needed part in order to keep the engine in service, the job being done and undone a half dozen times before the supply arrives. When it is impossible to resort to the robbing system you have the gratifying spectacle of a \$15,000 piece of machinery lying idle for a week, awaiting a \$2 part.

These are some of the "efficiency" methods that our practical railway men are trying to get away from, but to go off half-cocked and try something that might be worse would be poor policy. The railway officials saw these leaks long before the efficiency people knew they existed. Mr. Kruttschnitt's paper in the *Railway Age Gazette* of May 5, 1911, shows the good work of the past. It might be known that a leak existed, but a watertight bung might not be easy to find. We will always find the railway official on solid ground several years in advance of the self-styled efficiency man.

Bigger men closer to the actual operation and fewer statistics would seem more along the line of real efficiency.

Regulation is here to stay and this is really as it ought to be. It should be, however, by one commission in no way governed by politics, and not by 48 commissions all more or less influenced by politics.

In conclusion, why do not the efficiency men try to solve the question of the real inefficiency men, union labor? This is a purely social question and more properly comes within their province. Why delude ourselves longer under the guise of policy or political expediency, with the argument that combinations of labor are necessary? Justice to the working man is necessary if we wish to get efficient service, but the present position of union labor is selfish and untenable, their one idea being to get the maximum wage and give the minimum service. What will be the government's position in the struggle which cannot be much longer avoided? Are the railways to be arbitrated out of existence? The past decisions of the arbitration courts have been to

give the men all they asked for. If the other decisions are to be similar we might as well prepare for government ownership.

YARDMASTER.

THE SUPPLY DEPARTMENT—D. A. D.'S ARRAIGNMENT OF THE DEPARTMENT "INDIAN."

OTTAWA, Ont., November 29, 1911.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In the issue of the *Railway Age Gazette* of November 17 I find a short letter of my own on this subject,* and note that the editor has kindly stated that he will allow me a little more space in which to further consider the matter of supplies, and the supply department.

I have no quarrel with any one who claims that the supply department has not reached perfection. In fact, I have small use for those who think it, or their particular part of it, has reached that desirable point. From that class we can only look for that self-complacence that is death to advancement and improvement. But surely it is rather late in the day to intimate that there is no place in the railway world for the supply department organization. D. A. D. cites two roads that have no such organization; and they were doing very well, thank you, when last heard from. As I don't know anything about these roads, I will only take his word for their happy state, and let it go at that. The only road I have known of late years without a supply department never got more than two jumps ahead of the sheriff in its life, and finally its foot slipped. When rounded up, and started on again it had a supply department, of a kind, added to it. *Verbum sat sapienti.*

Now, I am not saying that the lack of a supply department organization put this particular road "into clear," but the fact that there was no supply organization indicated that there was a lack of organization generally. Had the men in charge organized their supply department, such an act on their part would have indicated a good work finished and done. For we all know that this is the last piece of work in the organization line undertaken. Its absence was only the outward and visible sign of an inward and real lack of cohesiveness; result, it fell to pieces.

In looking back over the history of our railways we find that they have been built up bit by bit, and piece by piece, as the need of the parts were felt, with, until very recently, small regard to the thing as a whole. How imperfect the whole is has been pointed out by better men than I; but we of the supply department have at least as good a right as others to feel that our small brick was not added to the pile until the need of us was felt. If we do not yet fit in well is the fault more with our brick than with the others? I am not so sure but what the fault lies more in the foundation than the superstructure, for who can honestly say that the place of the supply brick is not in the foundation itself, rather than stuck on to some corner in an attempt to bolster up a none too steady structure?

The trouble with the question of supply is that we hate it. We hated it when as a boy we filled that old woodbox behind the stove. We hated it later when the "kiddies" wanted new boots, that wore out so quickly; and we continued to hate it when we were general manager of a railway, and the same old question held us down, and made our annual reports look so cheap. But as it is the beginning, the middle, and the end of all things, we cannot get away from it; so we must face it, as we would any other enemy, and subdue it lest it devour us. It cannot be eliminated; to tame it, and keep it in reasonable bounds, is all we may hope to do; and for that purpose we have the supply department organizations on our railways. That they are imperfect we allow, but the knowledge that not one other department is perfect enables us to keep on with some small hope for the future.

I have no desire to point out defects in other departments;

*This was the letter entitled "D. A. D. and the Supply Department," and signed "Storekeeper."

the live ones know them for themselves, and it is a waste of breath to talk to the dead ones. If we of the supply department do not know most of ours, it is not because we have not been told of them; we have, by all and sundry. But so long as we are only accused of trying to save our company money we feel that we cannot be so far wrong. A wise statesman once said that when he went to steal apples he always looked for the tree with the greatest number of sticks lying around it; on it was sure to be the best apples. If we can only manage to twist that into a simile for our own case, we would be happy, but can we?

In the beginning, man, each of him, hunted for himself alone, later for himself and mate. In the early days of the railway it was much the same; and the first attempt at organization was the appointment of the purchasing agent, or the setting apart of one to buy for all. There are men living today who can remember that they thought this move settled the question for all time. But to their surprise it settled nothing beyond the fact that they knew little, or nothing, about the matter. It did not decrease the outlay as a whole, nor did it show more clearly than before what it was costing to order, receive, and distribute the material. On attempting to learn this, the business was found so mixed up with the regular work of the different departments, that it could not be separated, nor could the cost be even guessed at, while the only interest the departments felt in the matter was to get all they wanted, and a little more, to be safe. For this reason each department had its own little surplus, which in the aggregate made a big one, and yet there was no surplus for general use. So the next logical idea was that, if it was good business to have one man devote his time to buying for the whole, why not have one or more men receiving, caring for, and distributing for the whole? And here is where the storekeeper, and storehouse, entered on the scene.

In what way was this move designed to be of general benefit? There were many reasons why it should be. In the first place, it removed a large amount of work from the department offices that did not fit in well with the work the department office was designed to perform, and left those offices in much better shape for carrying on their legitimate functions. It took the work out of the hands of men to whom it was a secondary matter, and placed in the hands of men to whom it was the first, and if properly done, only matter. It brought supplies to a central point, and placed the surplus at the disposal of all. The man, or men, to whom the handling of supplies was now the chief aim, would naturally become proficient in the work, and proficiency has generally meant economy.

Now, as to the cost. For here we have a new department, and we know what it costs. But is the cost more, or less, than under the old plan? Who is there that can answer this question and show the figures to prove his statement? I refer here to the cost of handling, receiving, caring for, and distributing. Owing to the manner in which the work had been mixed up with the department work, we cannot well get these figures, but the work was there to be done, and it was done, and as we have never yet succeeded in getting something for nothing, nor any great amount of work done at that price, it is only fair to assume that it was paid for. But we don't know how much was paid for it, and we like to know what a thing costs. As done by the store-keeper we do know, and would it not be also fair to assume that in doing it, and it alone, he does it at least as cheaply as it was done by many others, who had other, and from their point of view more important, duties to perform? I think it would be fair to assume this without further evidence. But now and then we can get a small amount of what we might call corroborative evidence. For instance, when a department other than the supply department, owing to local conditions, and the wish of some official, assumes the care of certain material and supplies, reporting same to the supply department, we find one of two conditions: Either the supplies are not properly looked after and reported, or the work is well done, but more money is spent in

doing it in proportion to bulk and value than when it is done by the supply department people. And the money so expended does not appear in the right place, for it is not shown as expense in connection with supplies. Now, before setting the above down as a prevarication, take a look around and see what you can find for yourself.

I am not sure that I grasp D. A. D.'s full meaning when he says the development of the store department has been one sided. If I may take it that he means it is, as yet, incomplete, I would be glad to agree with him. It is. For one thing, it has not as yet secured such complete control of material and supplies as it should have, and there is constant effort on the part of minor officials, and some who are not so minor, to further weaken that control. Will our critics say that the reason for this is that we have shown ourselves incompetent? Well, now, would a general manager consider himself, and the results he can show, fairly judged if his authority were restricted, or his control of the property incomplete? I think not.

The question, "Have you given due weight to concealed items of expense in arriving at the point of handling company's material?" is very much to the point. But I am not sure that the full force of this question is levelled at the supply department men. The man who asks that question knows that many of the concealed items are not concealed by him; he is not called on to show them up, and oh! my brethren, how many of you have seen a railway man digging up "concealed item" of expense for the fun of showing them to the "old man" and hearing his opinion of your department? Alas, the supply man is only human, and if it be permitted that others take a few "items" and bury them, as they do, can we expect him to rob a grave just to make a smell around himself?

But why are there concealed items at all? That brings us back to our starting point: our dislike of the whole question; right back to that old woodbox that we were always filling, and that would not stay full. Do you remember how we would slip the tough old "chunk" off to one side in the hope that some one else would tackle it, or how we would cross the bottom sticks so it would take less wood to make a showing at the top. And how our little tricks were always seen through? Well, "men are but children of an older growth," and in some way or other we are still filling our woodbox, not loving it yet, and playing our poor little tricks. Then along comes D. A. D. and kindly, but firmly, with a twinkle in his eye, tells us to "saw wood." All right, D. A. D., there are no hard feelings, but we hope you can spare a day soon, to help with some of those hard chunks that are too much for our, as yet, weak arms. You swing a good axe, and little you care where the chips fall.

In spite of all the stones thrown at us, we doubt if there are many railway officials who would be willing to see the supply department eliminated. Why, what would then become of that old stock excuse for delay to work "waiting on the stores." Like a good lie, it has become "our ever present help in time of trouble" to so many of us. I say us, because I have sat in the seat of the scornful myself, when the question of supplies, with me, began and ended with my own small wants, and little I cared for the quantity or cost, so long as I could show my piece of work complete, in a manner to pass inspection. And am I not as other men knowing one thing at a time, and that imperfectly?

The supply department was created for a purpose, when the need of it, for that purpose, was felt. It is imperfect, as all work of man is imperfect, but before being judged either for praise or condemnation it must have a fair trial, and it cannot be tried fairly until it has full scope in its own field. The mechanic who is allowed to begin a work that a man of less training will finish—should he be held responsible for the finished article? And we ask for an extended jurisdiction, and more complete control. The writer to whom reference has been made points out clearly and sharply the manner in which the chief executive

officer will so often give purely perfunctory attention to requisitions, even at times refusing to sign them at all, but passing them on to the supply department, with a hint to supply what they can't hold back, or words to that effect. Now, I sympathize with that chief executive officer from the bottom of my heart. How is it possible for him to *know* that each of these hundreds, nay, thousands, of items are actually required, and in the quantities shown? He cannot. But do you say he has there the signature of his heads of departments to show? That all is well; but if he is a wise old bird he has learned long ago that in this matter of supplies the signature of his chief of department is only too often there simply because *his* foreman, or clerk, has signed it ahead of him. And what is the chief executive doing when he acts thus more than applying to this half-understood matter the principles of the most modern political science, and leaving it open to the referendum, and recall, after it has passed the test of the purchasing agent's analysis, and bid for prices? There is a reason for such action on the part of the executive. He has his supply department; why should he not make use of it to the utmost?

On the other hand, let me cite a case. A manager who was most painstaking in viewing each item on requisition reduced the number of hand lanterns and monkey wrenches, then signed the sheet so amended, with a feeling of duty done. But he had, in looking for small things, overlooked an item for a piece of machinery that a foreman had a notion he wanted, and that cost more than all the other items put together. The requisition was signed; there was not the sympathy between the executive and the purchasing agent that there should be; so the machinery was bought without further reference. The manager nearly had a fit when he had to approve the invoice, and to help soothe his feelings he found he had created an extremely awkward situation on his road, because there was want of hand lanterns and monkey wrenches. Oh, no; this was not on *your* road, but I know the road, and men. And there are others.

The executive is appointed to operate the railway, and the many departments are created, each to do a part, and assist in the whole, and while they must all work together we hear little complaints from one against the other. Indeed, some of them are so far apart, and come in contact so little, that it would be strange, indeed, if they should not find anything to disagree about. But far or near, great or small, they all come in contact with the supply department, and they come with complaints. We cannot say to them, come with a good will or come not at all, for they must come. We *would* not exist if they were not here, they could not exist if we, or something to take our place, were absent for long. Are they justified in their complaints? At times, perhaps, yes. But is not a man prone to forget quickly the one thousand times his wants have been met, and remember long the one time he has had to wait? One charge they have not yet made against us, and that is that we are too liberal with the goods intrusted to our care. Responsibility has made us conservative. But while the departments charge us with following a niggardly policy, the executives are firm in the belief that we delight in handing out everything we have, and coming back, like the daughter of the horse leech, with cries of "more," "more."

We have good authority for the statement that man cannot serve two masters, but we must keep trying to do so, anyway, and if we do not succeed in fully satisfying both we can at least plead that we are attempting the impossible, and leave it to fair and understanding minds to say to what extent we have failed. We have many problems ahead of us; the railways are in themselves a great problem. Their history is a history of great things done, and many costly mistakes made. D. A. D.'s criticisms and questions are mostly pertinent and to the point. But we have long known that a person of inferior mental capacity may often puzzle a sage, so it would be strange indeed if the old gentleman would not have the boys guessing at times. He does not

hit the supply department any harder than he does some others, and honest criticism should do us good, rather than harm. We are called the "spending department." Know then all men by these presents, that it is our ambition to be, and some day be known as, the "saving department." We can take no part in selling that "intangible commodity, transportation," that you other departments deal in, but we do help in making it for you to sell. We give the best that is in us to our part in serving each and everyone of you, and helping you to make money. Do you, then, give our part some thought, and help us to *save*? The end is the sum. Devote a little time to the thought of what you can get along without, rather than to figuring on how much you can get. Collect your tag ends of unused material and send them to the supply men. If you can't use them to advantage, someone else may be able to do so, and if they can't, the supply man just loves to turn them into cash. That is about the only chance he has to bring money in.

The alleged fallacy that the user of material cannot be trusted with its custody was not introduced by the store people; far from it. The store people were introduced because many good men had, after years' of experience, come to the conclusion that it was not a fallacy.

The editor says, in defense of D. A. D. against "Orphan," that D. A. D. knows all about storekeeping. Well, perhaps he does, but, if my salary would allow of it, I would like to make a small bet, that he was never a railway storekeeper for very long. It's a very subduing occupation, and who can read "D. A. D.'s" exuberant effusions, and dream that *he* has ever been subdued? He skips like a roe upon the mountain, clearing obstacles with a bound, regardless of what may be beyond, in a manner that excites our admiration and envy. But, alas, we have in our time placed our profane feet, hastily, where even the angels walk carefully, or not at all, and the resultant slip has taken the "skip" out of us.

The user of material is the man who does the work. Have we ever seen the time when we considered it unnecessary to watch and supervise that work? Could we expect to get satisfactory results if we did not do so? Then, if it is necessary to check him in the thing by which he must stand or fall, the thing that is of first and vital interest to him, surely it is necessary to check him in a matter that is of secondary interest. Let me illustrate: A member of the B. & B. department sends to his chief a requisition for a carload of B grade 2 in. planking. His chief, with many calls on his attention, signs the requisition, and it goes through until it reaches the supply men, or, say, the storekeeper. He, being familiar with material and prices, as well as having a general knowledge of the work going on, wonders why a carload of best quality plank is required in the district from which the requisition came, and he returns the requisition to the maker of it, asking just what the plank is to be used for, and learns that it is required for repairs to coal bins. Result, a saving of \$200 on the carload, and the work does not suffer. This is one fact taken at random from many at hand.

The truth is that the man who actually fills the requisition is, if he knows his business, the best critic of the same. I venture to say that there is not a railway storekeeper in America but has many such items in his records. But he has no authority in the matter, and must handle them with diplomacy, and make the effort again and again, even when turned down with contumely by those who are more jealous of their fancied prerogative than they are of their company's interest.

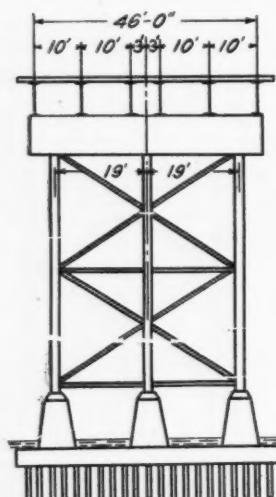
The supply man is judged by the departments on his ability to meet promptly all of their real, and fancied, wants; what a good time we could all have here if there was no hereafter. He is judged by the executive on the smallness of his stock on hand, and the amount of his bills payable; how easy to prepare for the hereafter if we did not have to live in the present.

E. J. MCVEIGH,
Storekeeper, Grand Trunk.

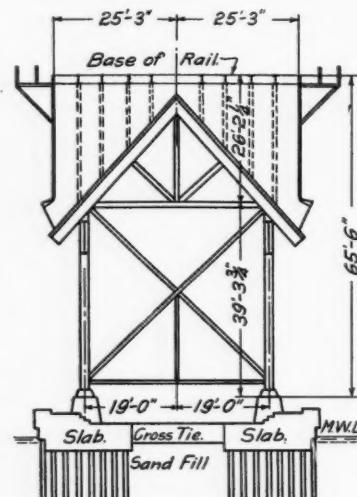
NEW ORE DOCK AT TWO HARBORS, MINN.

The Duluth & Iron Range has recently completed a new ore loading dock at Two Harbors, Minn., which replaces a wooden structure known as dock No. 1. The new dock makes use of steel instead of timber framing, reinforced concrete for bin walls and foundations, has an improved type of door for controlling the flow of ore and provision for raising and lowering the spouts by electric power. In addition to the increased capacity, these features of design embody the principal improvements made in ore dock construction in recent years.

The new dock is on the same site as the one it replaced, its center line being 18 in. from that of the old and parallel to it. A timber trestle approach 225 ft. long and a steel approach 317 ft. long lead up to the dock proper. The inner end of the timber approach is on a 9 deg. 30 min. curve, and both the timber and steel approaches are on a 0.304 per cent. grade rising towards



Bent #7.
Steel Approach.



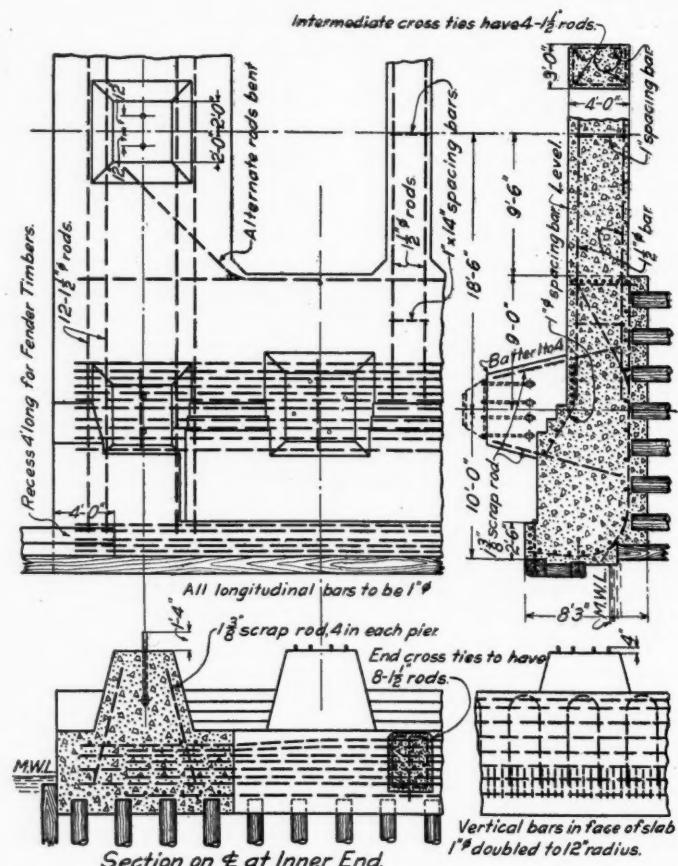
Typical Bent
of Dock

Framing of Steel Bents in Approach and Dock Proper.

the dock. The dock itself has 112 ore pockets on each side, each pocket being 12 ft. long, making a total length of 1,344 ft., in addition to which there is at the outer end a tower 32 ft. long on which engines at the head of ore trains can be run so as not to interfere with the filling of the outer pocket. This length of dock provides for the simultaneous loading of four of the largest boats used in the ore traffic. The dock is 51 ft. 8 in. wide, exclusive of machinery platforms, and 74 ft. high above mean water level, or 65 ft. 6 in. above top of masonry.

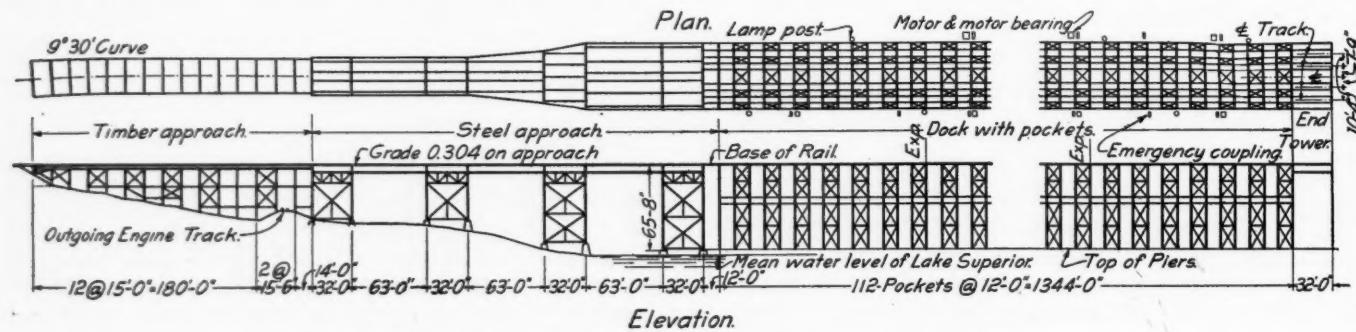
The timber approach consists of 14 framed bents spaced 15 ft. center to center, with the exception of the last three bents, the spacing of which is made irregular to allow the outgoing engine track to pass under the structure. The timber approach carries a double track laid on 8 in. x 16 in. stringers. The steel approach consists of four towers made up of three-column bents carrying

32 ft. tower girders and 63 ft. intermediate girders. The cross section of bent No. 7, shown in one of the accompanying drawings, illustrates the framing of these steel bents, and the accompanying elevation of the dock and approaches illustrates the transverse bracing used in the towers. The bents are supported on concrete pedestals carried on piles, the pedestals being spread to form a concrete cap over the head of the piles. The double track diverges to four tracks over the third tower of the steel approach. The section carrying the double track has four girders, the section carrying four tracks has six girders and the section over the third tower, where the change is made, has five girders.



Details of Reinforced Concrete Foundation Slab and Cross Ties.

The foundation of the dock proper consists of longitudinal concrete slabs under the two rows of pedestals tied together by transverse concrete cross ties at intervals of 24 ft. The piling in the foundation of the old dock was utilized as far as possible to support the new concrete foundation, piles being driven where necessary to complete the cribs under the new structure. The continuous concrete slabs are supported on pile cribs consisting of rows of seven piles spaced 2 ft. 6 in. apart in the row and 3 ft. between rows. Each tie wall between these slabs is carried on a



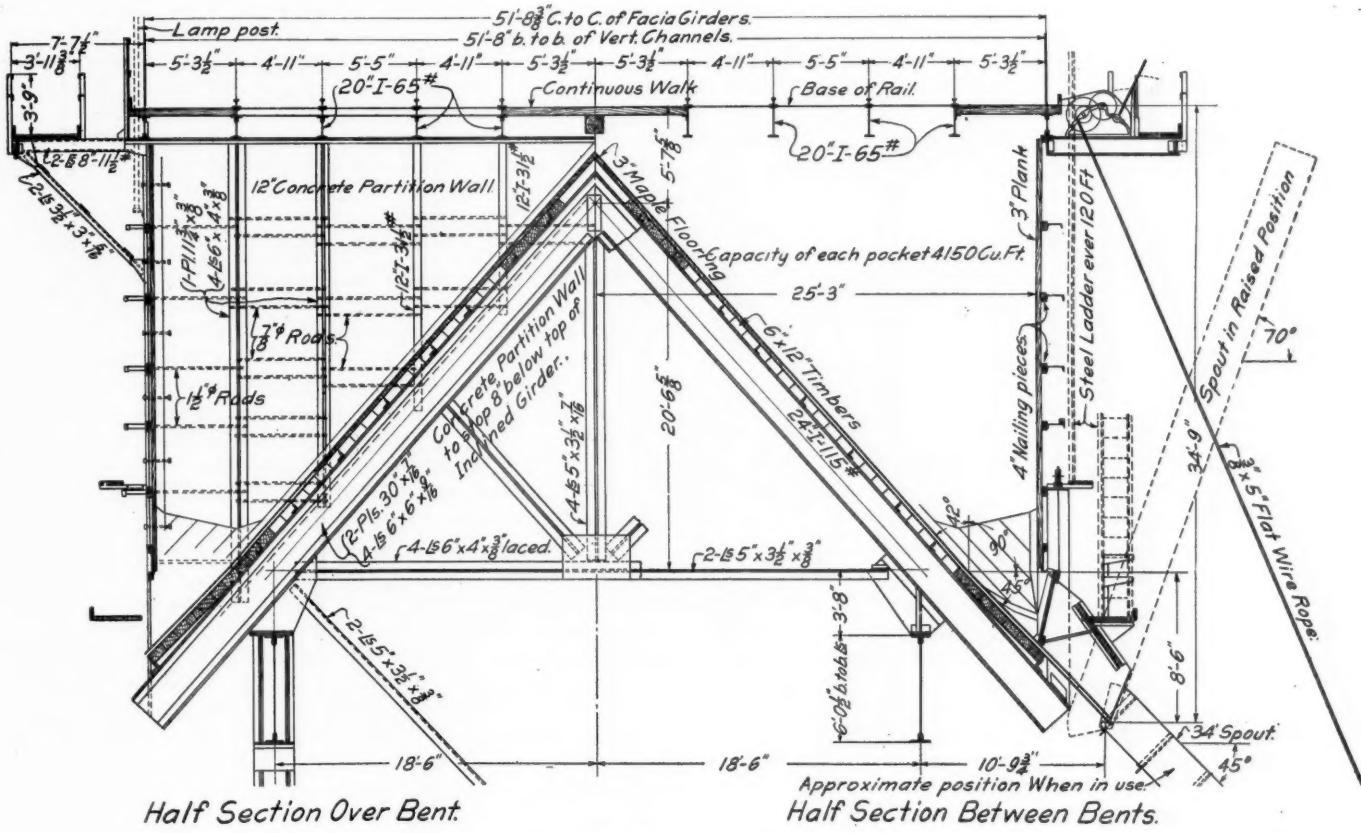
Plan and Elevation of New Dock and Approaches; Duluth & Iron Range.

single row of piling driven on 2 ft. 6 in. centers. The entire foundation under the dock is enclosed by a wall of wooden sheet piling, and the space between cribs is filled with sand or gravel. The piles extend 1 ft. 6 in. into the concrete slabs.

The details of the concrete slab are shown in a drawing reproduced herewith. The slab is 4 ft. thick reinforced in both the upper and lower reinforcing planes by $1\frac{1}{2}$ -in. round bars tied together by 1-in. spacing bars. This depth of slab is increased over the pile cribs on either side to enclose the tops of the piles and to provide a fender for boats lying alongside. The face of the slab is reinforced by 1-in. round bars doubled to a 12-in. radius and spaced 24 in. center to center. The center line of pedestals supporting the steel bents under the dock is 10 ft. inside the face of the concrete slab. These pedestals are 4 ft. 9 in. square on top and are battered one to four. They are reinforced by $1\frac{3}{8}$ -in. scrap rods set parallel to the surface of the concrete near each corner and extending down into the concrete slab. The concrete cross ties connecting the continuous slabs are 3 ft. wide and 4 ft. thick. The six ties at the inner end are reinforced

support 6 in. x 12 in. filler planks on which is laid a 3-in. hard maple floor. The pitch of this floor is 48 deg. with the horizontal, which is 3 deg. steeper than has been commonly used. It is expected that this change will considerably facilitate the emptying of the bins. The partitions between the bins, which are placed directly over the supporting bents, are of reinforced concrete 12 in. thick, in which are embedded vertical structural steel members which carry the load on the dock tracks down to the supporting bents. Each pocket has a capacity of 4,150 cu. ft., or 290½ tons on the basis of 140 lbs. per cubic foot of ore. The outside face of the bins is made up of 3-in. planks secured to 4-in. nailing pieces placed inside longitudinal channel members which are tied to the vertical members in the partition walls by 1½ in. round rods. Machinery platforms and galleries for operators are provided on the dock on built-up cantilever structures. Each rail of the double track on the dock is laid directly on a 20-in. 65-lb. I beam stringer, and the spacing between the rails is left entirely open. The tracks are spaced 10 ft. 4 in. center to center.

The structural steel in the dock conforms to American Railway



General View of Dock Construction.

Showing framing of bins, machinery platforms and galleries; also positions of ore pocket door and spout.

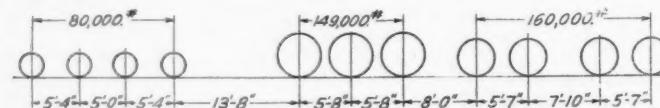
by eight $1\frac{1}{2}$ -in. rods tied with 1-in. spacing bars, and the remainder of the ties are reinforced by four rods placed near the corners of the section.

The framework of the dock is structural steel, the bents being spaced 12 ft. apart and consisting of built-up H sections carrying 72-in. longitudinal girders which directly support the weight of the bins. Each H section column consists of one 18-in. 60-lb. I beam, two plates 24 in. x $\frac{3}{8}$ in. and four angles 4 in. x 4 in. x $\frac{13}{16}$ in. The columns are 28 ft. $1\frac{1}{4}$ in. high and rest on cast iron bases 1 ft. 6 in. high. The two columns in each bent are spaced 37 ft. center to center, as shown in the cross sections. The transverse bracing in the bent consists of built-up angle sections. The flooring of the bin is carried directly on the A-frames of the bents and on two 24-in. 115-lb. I beams, spaced 2 ft. $7\frac{1}{4}$ in. each side of the center line of the pocket. Longitudinal purlin angles $3\frac{1}{2}$ in. x $3\frac{1}{2}$ in. x $\frac{3}{8}$ in. riveted to the bents and to these I beams

Engineering Association specifications for unit stresses and American Bridge Company specifications for workmanship. In making the design impact was added only for track stringers and vertical posts supporting these stringers. The live load on the track was calculated by the loading diagram illustrated in the sketch shown herewith.

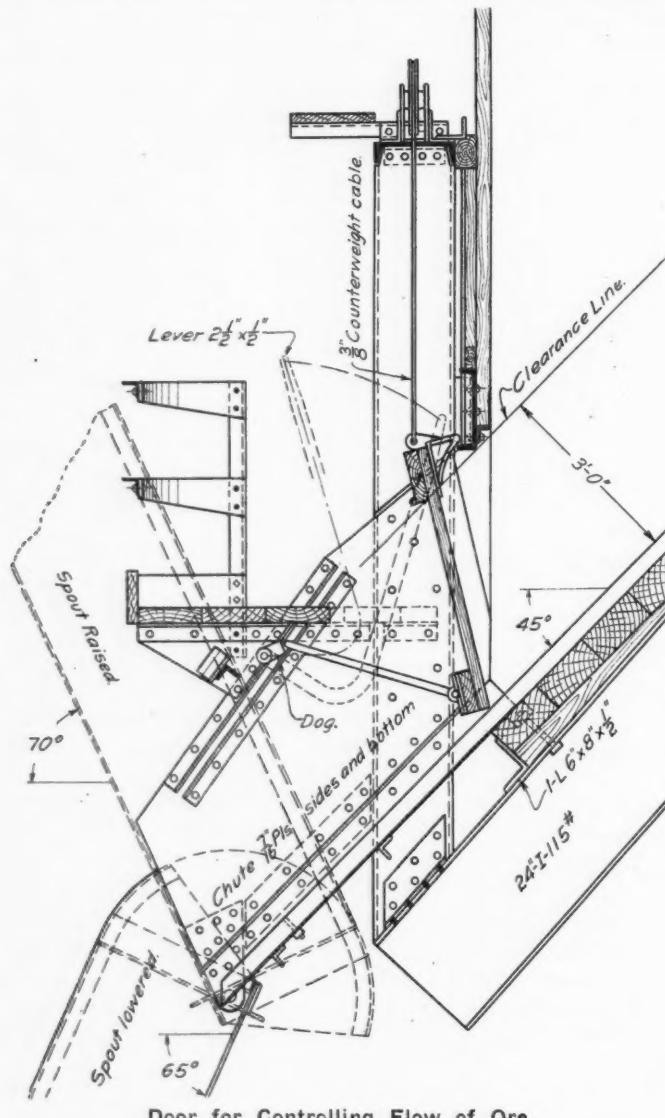
The slope of the bin floor which, as mentioned above, is 48 deg. from the horizontal changes at a point 8 ft. 6 in. above the lower edge of the chutes to 45 deg. It has been customary in dock design to provide small chutes $2\frac{1}{2}$ to 3 ft. wide allowing two, and sometimes three, openings from each pocket. By the use of an improved door design this dock was equipped with a single opening for each pocket 5 ft. wide, and 3 ft. high. The details of the chute and door are shown in one of the accompanying drawings. An ore pocket door has ordinarily been hinged at the upper end and it has been very difficult to shut it in the face

of a stream of ore. In the design illustrated the door is counterweighted. Its upper supporting point travels in a vertical groove and its lower edge is connected by a link to a rod moving in an inclined groove. The door is held closed by a dog, which prevents the movement of the rod in this inclined slot. When it is desired to open the door a lever connected with this dog and extending up to the operating platform is thrown over, removing



Loading Diagram Used in Design of D. & I. R. Dock.

the dog from the path of the rod and allowing the rod to travel downward in the slot. The counterweight at the same time pulls the door upward removing it entirely from the spout opening. To close the door it is lowered by means of the counterweight until the lever operating the holding dog can be thrown into the closed position. The arc described by the lower edge of the door has been so calculated that when the door is being



pushed into the ore stream the resultant pressure is practically normal to the floor of the pocket so that the minimum resistance to closing the door is encountered. The spout is of steel 34 ft. long, 2 ft. 6 in. high and 5 ft. wide. When in use it rests at an angle of about 45 deg., although it is possible to lower it until the slope is about 65 deg. from the horizontal. The spout is supported by a flat wire rope 3/8 in. by 5 in. attached at a point

about 7 ft. from the end of the spout. The upper end of this rope is wound around a drum connected to an electric hoist located on the machinery platform at the top of the dock. These hoists are operated in groups from a line shaft, 10 drums being connected to each motor, which requires a total of 11 motors on each side of the dock. The hoisting drums and line shaft are connected by friction clutches controlled by operating levers on the machinery platforms. The motors are designed to lift one spout at a time and no counterweights are provided. The spouts are prevented from dropping suddenly by pawls so arranged that the spouts must be hoisted slightly before they are released.

This dock was built under the direction of W. A. Clark, chief engineer of the Duluth & Iron Range. The American Bridge Company had the contract for fabricating and erecting the steel and the hoists were designed and built by the Whiting Foundry Equipment Company.

A LIVING RATE FOR THE RAILWAYS.*

BY MORRELL W. GAINES.

Under private ownership the railways of the United States, built and operated for profit, have grown far beyond the measure of the growth in other countries, where, for the most part, railways have been the care of the government. Our mileage per capita is five times that of Europe and ten times that of the world at large. Stocks and bonds outstanding per mile of line are a little over half the average amount per mile on the foreign railways, and the freight traffic per mile is three times as great. Rates per ton-mile are lowest in the United States, less than half of the average charged in other lands. Private enterprise, dominated by ambition, has fostered the growth of railways in this country not only in length and carrying capacity but in the direction of cheapness and efficiency.

Even before the assumption of control over rates by the Interstate Commerce Commission and by the several state commissions, the growth of our railways had become slower and of altered character. Fifteen years ago the progressive lowering of rates that characterized the preceding sixty-five years of our railway experience reached, at length, the point where it limited both form and rapidity of growth. High rates, where railways are operated for profit, mean rapid construction, new competition and, in due sequence, reduction of the rates. Until the depression of 1893-1896 rates in this country, although they had been steadily reduced, were still high enough, in view of the growth of traffic and the cheapening of construction costs, to make it profitable to build. The characteristic of the whole railway era had been swift expansion.

Then the time of low, limiting rates arrived. Railway growth, while not absolutely pausing in mileage, turned from the goal of new revenues so that of operating economies. Capital sought decreased costs, which were certain, instead of increased haul, which was now of dubious profit. Growth turned visibly from light traffic extensions and competing routes to improvements on heavy traffic lines. In due sequence the absence of new competition has made itself felt and the rates have become more steady. For these fifteen years they have been stationary.

The record of the extension of lines (with the rates for which they were extended) reads as follows by decades:

Year.	Miles of Line.	Increase.	Per Cent.	Rate per Ton-Mile.	Rate per Pass.-Mile.
1832	229	229	...	....	....
1839	2,302	2,073	905	....	....
1849	7,365	5,063	220	....	....
1859	28,789	21,424	291	....	....
1869	46,844	18,055	63	....	....
1879	86,556	39,712	85	*1.29c	†2.422c
1889	161,276	74,720	86	0.922	2.165
1899	194,336	33,060	20	0.724	1,978
1909	236,869	42,533	22	0.763	1.928

*1880. †1883.

Railways are generally built for their prospective earnings. The influence of rates on construction is seen in the percentage

*From an article in the *Yale Review* for October, 1911, and reprinted from it by permission.

of increase more clearly than in the actual miles of new line. At the beginning this was a poor country and the cost of railway building, with hand labor and high prices for rails, was great. A mile then involved more effort than five miles now. Viewed in this light, the period ending with the Civil War was one of swift expansion. For the next thirty years construction was still at a rapid advance, averaging 8 per cent. per annum of the existing mileage. For the last twenty years the expansion has been only 2 per cent. a year, or less than the growth of population. The great prosperity of the past ten years has not materially stimulated building, although there is abundant room for new lines. Low rates have limited the growth of railways.

Nearly all the construction done since the days of high rates passed has been under three heads: (a) Branches of existing lines which could obtain a long haul over their connecting rails; (b) important through routes (usually in connection with existing roads); (c) development lines to coal or lumber holdings, or other sources of heavy tonnage. Only in those sections of the country where rates are still high, as in the Far West and the South, is any considerable amount of new mileage of any class still undertaken.

Instead of building extensions the railways have turned, in the last fifteen years, to making improvements. The following table shows how their facilities have grown and the effect on the traffic capacity:

Year.	2d, 3d, and 4th Track and Sidings Owned-Miles.	Freight Cars in Operation.	Ton-Miles Freight Carried.	Ton-Miles per Mile of Line.
1894	54,825	1,205,169	80,335,104,702	457,252
1899	63,070	1,295,510	123,667,257,153	659,565
1904	84,830	1,692,194	174,522,089,577	829,476
1909	106,949	2,073,606	218,802,986,929	953,986
	95%	72%	172%	109%

This table reverses the story of the table showing extension of lines. Instead of slowing down, as in the case of new construction, the railways have built more rapidly. They have added nearly as much to facilities in the last fifteen years as they had accumulated by 1894 during all their previous existence. Nor does the table tell the full story. The average capacity of freight cars was 28 tons in 1902, the first year reported. In 1909 it was 35 tons. No doubt the average in 1894 was below 25 tons, and the increase since that date in total load-capacity, if not in cars, has been well over 100 per cent. And besides these items of tracks and cars, the reducing of grades, straightening curves, strengthening bridges, ballasting and putting down heavy rail, not shown in the table, have used up a sum of money running into hundreds of millions of dollars. As a consequence of their vast outlay for improvements, the railways are able to carry twice as much freight per mile of line as in 1894, or two and three-fourths times as much altogether.

The railways were not only forced from extensive development by low rates. They were forced into intensive development; because they had to cheapen their haul. The increased density of traffic that is a necessary consequence of accommodating a rapidly growing country to a slowly growing mileage finally resulted, as every one knows, in an unwonted prosperity for the existing lines. Railways are pre-eminently subject to the law of increasing return. They have accordingly, while not immoderate in their distribution, paid of late years a much larger aggregate of dividends than in the days of high rates. Out of their distress they brought a measure of abundance. The passing, thus clearly marked, from the era of competitive building and high rates into an era of non-competitive rebuilding and low rates, has worked to the great advantage of established lines and settled communities and to the disadvantage of new roads and unsettled or thinly populated regions.

During the last five years, and particularly since the amendment to the Interstate Commerce Act that went into effect a year ago, a new and powerful influence has been brought to bear upon the current of railway growth. It is too early to measure closely the effect of the downward control over rates and the upward control over expenses imposed by public authority. It

is by no means too early to review the situation and point out its tendencies.

In so doing, to be fair, the immediate and most evident results of the decisions of the Interstate Commerce Commission in the Trunk Line, and Western, rates cases, handed down last February, must be entirely disregarded. It is true that orders for equipment have practically ceased; that the rail orders are halting; that entrenchment is the watchword with maintenance as well as with improvements; that extensions are in abeyance, and that there is no money to be had for new lines. But these are temporary effects, the result of shock, and will pass. In the end the purposes and practices of the Interstate Commerce Commission will be clearly understood and fully reckoned with.

Railway growth is a matter of interest on money invested. The capital requirements for the next five years, according to the rate of development of the recent past, will be \$500,000,000 a year. The incentive to growth which will cause this sum to be forthcoming lies wholly in increased net earnings. Contrary to the popular conception, the railways are not, and have not been even in these last few years of prosperity, operating on a basis of wide profits. Their margins have been narrow. If the new regulation exerts an appreciable effect on rates or on expenses it will have a great deal of effect on growth.

The following table, based on operations and not on capitalization, shows what returns the railways get out of the business they actually do. It is compiled from the Interstate Commerce Commission reports, omitting duplications:

Year ending June 30.	Gross Earnings.	Net Earnings after Taxes.	% Net to Gross.	Other Income.	% to Gross.
*1889	\$96,816,129	\$292,519,034	30	\$25,794,090	3
*1894	1,073,361,797	305,391,315	28	20,855,071	2
1899	1,313,610,118	409,708,295	31	26,044,996	2
1904	1,975,174,091	574,128,143	29	49,380,970	2.5
1909	2,418,677,538	728,298,805	30	73,586,827	3

*1889 and 1894 approximated.

Year ending June 30.	Interest, etc.	% to Gross.	Dividends.	% to Gross.	Surplus after Dividends.	% to Gross.
1889	\$227,330,541	24	\$71,704,045	7	\$19,278,538	2
1894	281,814,744	26	79,772,895	7.5	†35,341,253	3
1899	248,760,382	19	94,273,796	7	92,719,113	7
1904	296,063,447	15	183,754,236	9	143,691,430	7
1909	388,273,154	16	236,620,890	10	176,991,588	7

†Deficit.

The average operating profits of the railways have been 30 cents out of each dollar received for transportation. Out of this 30 cents they paid 25 cents fifteen to twenty years ago for interest on borrowed money, and within the last few years have paid 15 cents. In dividends they paid 7 cents in the earlier years, trenching on accrued surplus to do so, and have now increased the distribution to 10 cents. Since the crisis of the nineties a balance of 7 cents, out of the dollar charged the shipper and out of "other income," has been put back into the property or applied to deficits and general corporate needs.

Any cut in rates would operate to reduce the margin available for improvements. A cut amounting to 5 cents on the dollar would impair dividends on all roads of lesser strength and threaten the dividends of the rest. A 10 cent reduction would directly injure many bonds and indirectly weaken the security of all bonds to an extent that would send quotations down and make new financing impossible. There is, therefore, no appreciable margin for reduction of rates without prejudice both to the properties themselves, to their owners and to their creditors.

Some hold the opinion that bonds and stocks are so watered that the payment of the current interest and dividends is an injustice, and that rates should be reduced in spite of the injury to security holders. The equity and policy of this position may be doubted, but it would be idle to make direct answer. No appraisement has been made of railway property as a whole. The value, on any reasonable basis, is probably measurably near the total of stocks and bonds outstanding; but this value cannot be proved in the absence of an appraisal. However, even those who hold this opinion concede that rates should yield a fair return on the actual railway investment. The circuit court in Minnesota has recently affirmed the right of railways to a 7 per

cent. return on values approximating, for the roads of that section, the actual issues of securities. As a hypothesis, a 6 per cent. return may be assumed to be both moderate and ample, and the following table can be constructed to show the theoretical capitalization upon which the railways are actually receiving 6 per cent.:

Year end- ing June 30.	Miles of line.	Miles of track.	Effective capitalization.	Per mile of line.	Per mile of track.
1889	153,385	186,627	\$4,983,909,767	\$32,493	\$26,708
1894	175,691	229,796	6,026,460,650	34,301	26,225
1899	189,295	252,364	5,717,236,300	30,203	22,655
1904	212,243	297,073	7,996,961,383	37,678	26,919
1909	235,402	342,351	10,414,900,733	44,243	30,422
Average.....			\$35,784		\$26,586

The "effective capitalization" is the sum of the interest and dividends actually paid out divided by 6 per cent. It has no relation to the par value of railway securities outstanding. Watered stocks which pay no dividends can obviously have no bearing on rates, while stocks that pay 12 per cent. should, with equal obviousness, be conceded a weight of double their par value.

The effective capitalization, or figure upon which a 6 per cent. return is received out of rates paid, is really very low, just as it stands, when measured per mile of line and per mile of track. It includes, however, several items which, in proper fairness to the railways, might well be segregated from the capitalization of the lines as such. In 1909 the outside investments of the railway companies, not connected with rail transportation, produced a clear income of \$73,586,827. Capitalized at 6 per cent. these investments represent \$1,226,447,117 out of the \$10,414,900,733 total. In 1909 also the railways, in consequence of the rapid increase in their quota of equipment, owned 57,212 locomotives, 45,584 passenger-train cars and 2,172,696 freight and company cars. Prices for the heavy purchases of recent years have been higher, so that it is conservative to postulate an average cost of \$12,000 per locomotive, \$4,000 per passenger car, and \$800 per freight car: at which prices the value of the equipment becomes \$2,607,036,800. The sum of these two items is \$3,833,483,917, which, being deducted from the \$10,414,900,733 total, leaves \$6,581,416,816 as the capitalization of the railway lines proper. This figure amounts to only \$27,958 per mile of line, and \$19,224 per mile of track for 1909, the best year of railway history for which detailed statistics are obtainable. For any previous year the figures would be still smaller. This net effective capitalization is sufficiently low to show clearly that the railways are not distributing 6 per cent. on an inflated valuation. It is undoubtedly far below the costs of construction for the railways of the country as a whole. It is below the general valuation obtained in the partial investigations made by state railway commissions, whether based on original cost, reproduction cost, depreciated cost, or cost including intangible assets such as traffic and location.

In a sense there can be no average cost of building railways. Some lines have been laid down across flat prairie at \$10,000 to \$12,000 a mile. Others, like the Virginian, with heavy rails, ballast, steel bridges, tunnels, great cuts and fills, and excavations of rock, have cost over \$100,000 a mile in cash. Aside from mere construction costs, the terminal real estate alone, in which each city calls for its own heavy investment, would eat up probably half, at present prices, of the \$6,581,480,816 net capitalization. Ties and rails and right of way do not make a railway. The general cost, which has never been completely measured, is almost certainly above \$40,000 a mile.

The popular impression that railways are imposing exorbitant capital charges on their traffic arises from the fact that some conspicuous railways pay large dividends, and that the total of stocks and bonds issued on the railway properties, according to the Interstate Commerce Commission report, is \$59,259 per mile of line. The point is lost sight of that the overcapitalizations of the dark ages of railway financing, 25 to 40 years ago, handed down to us in one form or another, have been as a general rule punished by inability to earn dividends. In 1909, 36 per cent. of

stock and 10.5 per cent. of bonds paid nothing, although that was (with the possible exception of 1907) the most prosperous year the railways had ever had. The net capitalization, excluding idle stocks and bonds is small, and the average of the dividends and interest paid is low.

Still, though dividends and interest be moderate, the objection is heard that the railways are piling up large surpluses out of earnings beyond what they distribute to their owners, and that this in effect constitutes an unreasonable burden on rates. To this objection the Interstate Commerce Commission, both in the eastern and the western rate cases, has unfortunately lent the weight of its authority.

In any sober consideration of the matter it is much to the credit of our railway managements that they have, to a conservative extent, foregone dividends in favor of improvements to their lines. The process does not add to the burden carried by the rates. In England stockholders take, as by right, the entire surplus earnings. So in that country capital account is necessarily added to, year by year, for improvements here provided out of surplus. In twenty years' time the interest on the added capital under the English plan amounts to just as much as the annual appropriations of the American plan, and in the long run it comes to impose a direct burden on the traffic. As a matter of experience the capitalization of the English roads, now \$274,964 per mile, has grown to unwieldy proportions, and the lessening of operating costs through improvements that would allow lower freight rates, lags far behind the American standard. Our practice should not be condemned. It is thoroughly sound finance and lightens, rather than increases, the weight of the tariffs.

Upon complete examination, therefore, of the earnings of railways it is plain that rates are low enough and contain no undue charges whatever on account of capital invested. Those who use the railways could hardly ask a reduction in the price for the services rendered. From the standpoint of growth, which is that of public interest, the rates are too low.

No case has yet been before the Interstate Commerce Commission relating to the general reduction of rates. That body has, thus far, merely picked out individual rates here and there and decided cases involving one form or another of discrimination. The only cases involving the general rate level were those decided against the railways last February on their application to increase their charges.

These cases were disappointingly barren of facts, but rich in indications of policy bearing on the future of railway rates. The position both of the railways and of the Commission was futile, and the final result was that of a case not proven. In effect the argument of the railways was that they should have higher rates because they were oppressed by their expenses and needed the money. They were unwilling, or unable, to establish fixed criteria of a reasonable return from transportation and rested on the assumption that their old rates, prior to late increases in wages, were fair and should now, therefore, be raised to match the cost of operation.

The reply of the commission was that the former rates, while carrying a certain sanction from long usage, afforded no absolute standard of reasonableness. Figures—inaccurate and misleading because of the inclusion of duplicated dividends and duplicated capital, and because of the accrual in surplus both of premiums on stocks and bonds and of amounts that would, under the system of accounting devised two years ago by the Interstate Commission itself, now be written off for obsolescence—were adduced to show the great prosperity of the railways. To the plea of the railways that they were in need, the commission replied in effect that they had had plenty of money the year before; and so were not entitled to higher rates this year. But, said the commission, if you ever come to dire want (referring beyond doubt to a time when the whole country should be in the throes of distress), come to us and we will raise your rates. The railways were looking ahead to a period of lean traffic and high expenses. The commission was looking back to full traffic

and lower expenses. In fact it had so little appreciation of the actual situation as to prophesy that net earnings for 1911, now fallen off from 10 to 15 per cent. in the trunk line territory particularly in view, would be substantially as high as they were in 1910. It proved impossible to persuade the commission to take any but an academic view of the actual facts.

As to principles, both sides were in error in thinking stress a proper excuse, or a period of depression a fit time, for the raising of rates. There could be no grosser favoritism than to levy on distressed industries a forced contribution for the benefit of distressed railways. It is altogether against fair play. The commission takes but an empty view of its own powers in dreaming that it can, by fiat, accomplish the salvation of the railways in an hour of crisis. What is necessary is that rates shall be set so firmly on a basis of prosperity for the railways in time of prosperity that they can meet adversity out of their own accumulated strength. Otherwise rates are radically insufficient. This, in other words, is the opinion of Judge Sanborn in the Minnesota rate decision, handed down last April.

As to results, the railways were not ruined, or permanently damaged, by the refusal of the commission to grant the increases. The average annual increment to net earnings for the nine prosperous years ending with 1907 was \$50,000,000. The total of the rate increases asked for, East and West, would also have produced about \$50,000,000. Thus the roads were, in effect, petitioning to be set forward a year or two in the recovery from the present dull times. At the worst the decision deprived them of no more than two years' growth.

After a time they may get part of the relief asked for, not along the lines of the specious argument of Mr. Brandeis, who accused them of wastefulness, but from the natural fall of costs and, perhaps, of wages. More they may look for from the ultimate return of traffic to its ordinary increment of volume. In the meantime their earnings are unsatisfactory and their growth is at a standstill, except for bare necessities. Rates are too low for the conditions and too low for sound and healthy progress.

As to the future of rates, these cases were an inconclusive episode. For an increase, the burden of proof is, by the express terms of the Interstate Commerce Act, placed on the carriers. It is always difficult to obtain an increase in charges from a supervisory body, constituted at once judge and public advocate, and it may be imagined that few increases will be granted under the new law. As to decreases, on the other hand, the burden of proof is, implicitly, upon the commission. Such decisions will be reviewed by the courts, which will hardly sanction a general return on railway investment below the existing scanty reward. The tendency of rates under regulation will no doubt be downward, but it will also be, and more strongly, towards crystallization.

In two respects, otherwise than by direct influence on rates, the principles enunciated by the Interstate Commerce Commission have an adverse bearing on the growth of railways. The commission does not recognize the costs of abandonment and reconstruction, or of non-income producing improvements, as capital outlay, but as charges to be defrayed out of income. At the same time it frowns upon the undue burdening of present rates with the cost of improvements designed to benefit the future. Thus, if the reasoning be carried into effect in subsequent accounting regulations, such improvements must come out of the pockets of the stockholders, being payable neither out of capital nor out of surplus. Naturally the improvements would cease to be made. The intensive growth, the characteristic forward policy of the present era, must then come to a full stop, except in those infrequent instances where it constitutes a clear addition to the existing plant, without replacements.

With respect to extensions, the commission states in explicit terms that the pioneering must be done at the risk of stockholders and not at the risk of shippers on the existing lines. That is to say, not only must each branch stand by itself (an object naturally in view in its construction) but the rates on the existing lines can carry no margin of surplus applicable to its deficits.

As is well known, extensions are ordinarily unprofitable for the first three or four years. The customary method of building railways, the only safe way, and the one followed in the development of all our railway systems, is to make the old lines carry the new, and to throw forward the advance from time to time only as the established traffic can carry the new capital cost. New construction will generally cease if the commission contrives, as it may, to put into effect its views on extensions.

The order given against the general advance in rates has now been supplemented by the decision in the Spokane and Inter-mountain cases, handed down in July, as well as by a number of minor decisions leaning towards reduction of rates. The principle of the Spokane case was different from that involved in the question of rate advances. The issue was discrimination, the familiar discrimination in favor of competitive points that is incorporated not only in the present rate system but in the currents of traffic, in the construction of lines and in the established commerce of cities. Although there may be justification for modifying the inter-mountain rates on the ground that discrimination here is excessive, the Interstate Commerce Commission has gone further in principle, and by a rigid interpretation of the amended long-and-short-haul clause, has declared abruptly for an upsetting of most important and delicate rate fabrics elsewhere. The decision will cause the transcontinental lines an estimated loss of \$6,000,000 in net earnings if it is sustained by the courts; and other roads must face, it is to be feared, similar, if smaller, encroachments on earning power.

Ultra-radical decisions are perhaps not to be expected from the Interstate Commerce Commission, biased although it appears to be and jealous of its own powers. It is a broader minded body than most of the state railway and public service commissions whose place and whose functions it must increasingly assume. Its decisions will themselves be regulated and moderated by the courts. Nevertheless, of a certainty, retardation of growth is implied in any such general supervision and regulation of rates by governmental authority as is now entrusted to the commission. Hope of profit has built our railways and keeps them on the battle line of progress. But wherever there is an attempt to secure the public interest by direct compulsion (which is the essence of regulation) profit, beyond a mediocre compensation for the use of money, or the grudging allowance of reward to exceptional efficiency, stands in the by and large for an unreasonable exaction.

There are many ways in which railways can cease to grow. "Economizing" in maintenance, now going on, is one of them. They can make the old cars, old rails and existing grades and facilities do. They can lay off men. They can cut down the passenger service, usually an expense in proportion to its direct return. They can cease to anticipate heavy traffic by buying a surplus of freight cars, and so force the shipper to wait his turn when the press of business comes. They can hold back the building of branches, making the farmer haul his produce a longer distance or leave his new land untilled. Where they must still expand they can buy a cheaper grade of equipment, build inferior lines, scant their facilities and second tracking. In short, they can cease to cope with the advance in the communities they serve. They do not desire this. In fact, they regard it as a calamity that they are forced, temporarily and in a measure only, into this path. The mere enumeration of items indicates sufficiently well the state of inertia into which regulation tends to press the railways.

If wisely guided, the Interstate Commerce Commission has a field of usefulness in preventing discrimination in rates. In the regulation of the general rate level, moderate though it may attempt to be and little subversive of the existing order, its influence cannot help but be injurious. The living rate for the railway is one low enough to make the traffic grow, and high enough to make the railway grow. It regulates itself and has produced in this country an unexampled development both of railways and of traffic. The reasonable rate for the Interstate Commerce Commission or for any governmental commission is

based on evidence of existing costs, existing traffic and existing investment. It is not a living but a dead rate unless imagination or speculation in the future enters into it. If the rate be artificial it will not produce growth. A mould can only set the form.

The regulatory system may confer, in the end, the boon of stability and heavy traffic upon the companies at which it is directed, with steady profits on capital already invested; but it will surely visit with blight the companies yet unincorporated and the growth of railways yet to be made.

JOHN C. STUBBS.

On January 1 John C. Stubbs retired as director of traffic of the Harriman system of railways. For several years it had been known to his more intimate friends that Mr. Stubbs intended to relinquish active service on reaching the age of 65, from a settled conviction that a man of that age holding a responsible position should sever his connection with active affairs as a duty both to himself and to the institution he represents. Several months ago this purpose became publicly known and a few weeks ago, at the time of the general readjustment of the Harriman lines plan of reorganization, the date was fixed as January 1, although Mr. Stubbs' sixtieth birthday does not occur until May 31.

With his entrance into private life, Mr. Stubbs has taken up his residence in his boyhood home town of Ashland, Ohio, although he still retains his connection in an advisory capacity with the railway system he has served for over 40 years. That Mr. Stubbs does not, however, feel entirely ready as yet to give up all railway work is indicated by the recent announcement that he has been engaged to examine and report upon the condition and requirements of the property of the Wabash Railroad, now in the hands of receivers.

On Thursday, December 28, Mr. Stubbs was tendered a farewell banquet in the crystal room of the Blackstone Hotel in Chicago, by many of the principal officers of the western railways, including presidents, vice-presidents and legal and traffic officers. "Thirty," the telegraphic code for "that's all," was engraved on the menus in commemoration of his retirement.

Mr. Stubbs has spent practically all of his business life in the traffic department of the railways now comprising the Harriman system. In October, 1870, when in the second year of his railway service, he became chief clerk in the general freight office of the Central Pacific at Sacramento, Cal. For the past ten years, as director of traffic of the Harriman System, he has held an office unique in the railway world, with jurisdiction over the traffic department of 18,000 miles of road.

By virtue not only of this powerful position, but also of his own personality and remarkable ability, Mr. Stubbs has for many years held a commanding position in the transportation world and has perhaps exerted a more potent influence on the

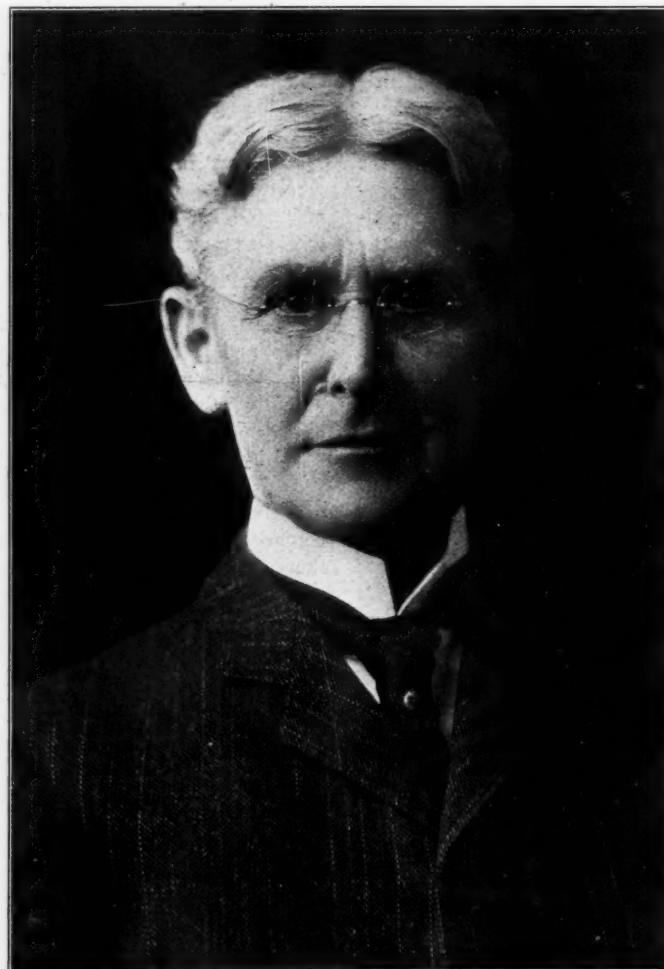
traffic destinies of the western half of the United States than any other one man. He was very largely responsible for the development of many important industries of the Pacific coast through his policy of making rates to foster a business that otherwise would be unable to compete in distant markets. For example, he is fond of telling the circumstances surrounding the first important eastbound shipments of raisins from California. A Sacramento farmer who wanted to make the shipment came to him to find what the rates would be. The tariffs had named \$3 per 100 lbs. The farmer thought the shipment would stand \$1.75. "Then, that is the rate," said Mr. Stubbs, and the general office confirmed it.

Mr. Stubbs was born May 31, 1847, at Ashland, Ohio. After a common school education his first railway experience was gained during his connection with the army in the Civil War, when he was assigned to transportation service and employed in

checking government freight. In March, 1869, he entered the service of the Pittsburgh, Cincinnati & St. Louis as clerk in the general freight office at Columbus, Ohio. In October, 1870, he transferred his allegiance to western railroading as chief clerk in the general freight office of the newly-opened Central Pacific at Sacramento, and on December 1, 1871, he was promoted to the office of assistant general freight agent. From July 28, 1873, to March 5, 1882, he was general freight agent, and from May, 1882, to October 1, 1884, he was freight traffic manager of the same road. On October 1, 1884, he was appointed general traffic manager of the same road and leased lines. On February 27, 1885, after the Southern Pacific had taken over the Central Pacific he was made general traffic manager of that company, and in December, 1889, he was elected third vice-president of the Southern Pacific. After E. H. Harriman had merged the Southern Pacific and the Union Pacific systems, he selected Mr. Stubbs and Julius Kruttschnitt as the keystones of his great operating organization, with Mr. Kruttschnitt as director of

maintenance and operation and Mr. Stubbs as director of traffic at Chicago. Mr. Stubbs held this position from July 9, 1901, until the date of his retirement. He was succeeded by Lewis J. Spence, who, for some time, had been his chief assistant at Chicago.

On October 5 a line in China was completed, which is not very long but quite important, and extends from Canton to the British town Kow-loon, on the main land opposite Hong Kong, where a large part of the commerce of China is transacted. It is 106 miles long, extending along the coast, about 19 miles being in English territory, this part having been built by an English company. The work was begun nearly four years ago. It has to compete with steamers for the through traffic. There is one express train, with but one stop between Canton and Kow-loon, which makes the 106 miles in five hours.



John C. Stubbs.

INDIRECT LIGHTING FOR PASSENGER EQUIPMENT.

Indirect lighting, which has been used extensively in hotels and other public places because of the even light and soft tones, has recently had two applications to railway passenger equipment. The dining cars on the Santa Fe Train de Luxe, which were illustrated in the *Railway Age Gazette* of December 15, 1911, page 1207, were lighted in this way; also the dining and observation rooms in the private car for B. F. Yoakum, chairman of the board of directors of the Frisco lines, which has just been completed. Although the Santa Fe cars were the first ones to be actually placed in service with this system of lighting, the possibility of using it was first considered in connection with Mr.

The center lighting fixture in the observation room is similar to the one in the dining room, except that the glass bowl is leaded with a combination of frosted, white granite and amber glass; the latter is used sparingly—just a spot here and there for design and to relieve the monotony of the frosted and granite glass. The ceiling of the room is finished in a cream white and the side walls are of mahogany.

Two small electric lamps, of the direct lighting type, are located under the lower deck in both the dining and observation rooms. Both the center fixtures are large, compared with those usually found in cars. The effect when lighted and also in the daylight is pleasing; this is due to the severe interior treatment of the rooms. The mahogany finish is very plain, with simple molding



Arrangement of Indirect Lighting Fixture in B. F. Yoakum's Private Car.

Yoakum's car, which, however, was a little slower in building than the Santa Fe cars.

The lighting fixture in the dining room is placed in the center of the room and is supported by four cast bronze chains. The bronze or metal portion is finished in verde antique, and the bowl is made of leaded glass, which is of sufficient density to give a soft color when lighted by the lamps inside of the bowl. No useful light for illuminating the room passes through the bowl. Underneath the twelve 25-watt tungsten lamps is placed a metal reflector, which redirects the downward rays of light to the ceiling of the room, allowing just enough light to pass the reflector to light the colors in the glass bowl. The ceiling of the dining room is finished in a dull ivory white, while the side walls are finished in mahogany; the carpets are green.

and plain panels. The large lighting fixtures are, therefore, the only decorative spots in the rooms and these lend themselves to the carrying out of the color scheme as well as to the finish.

That the illumination from these central fixtures is exceedingly good in both the rooms may be seen from a study of the readings at various points, which were obtained with a Sharp Miller illuminometer. The readings were taken 3 ft. above the floor, and their value may be more readily understood by reference to the table showing the requirements in foot candles, for various services, as compiled by Barrows. The location of the points at which the readings were made is shown on the accompanying diagrams. The direct electric lights were not in use when these readings were taken.

LIGHTING REQUIREMENTS IN FOOT CANDLES FOR VARIOUS SERVICES AS COMPILED BY BARROWS.

Assembly rooms, corridors, public spaces.....	5	to	1.5
Auditoriums, theaters	1	to	3
General illumination of residences.....	1	to	2
{ Good clear print.....	1	to	1.5
Reading { Newspaper print	2	to	2.5
{ Postal service	2	to	4
Churches	2	to	4
Library { General illumination	1	to	2
{ Reading tables	3	to	4
Ball room	2	to	3
Desk lighting	2	to	5
General illumination of stores.....	2	to	5
Bookkeeping and clerical work.....	3	to	5
Clothing stores	4	to	7
Display of dark goods.....	5	to	10
Drafting, engraving	5	to	10
Street lighting by gas.....	0.05	to	0.25
Street lighting by electricity.....	0.05	to	0.60
Light from full moon.....	0.025	to	0.03

Station.	Foot Candles.	Station.	Foot Candles.
3	3.60	8	6.40
4	3.40	9	4.62
5	1.96	10	2.70

Average, 3.28 foot candles.

Indirect lighting will probably be used extensively on private cars, dining cars and possibly parlor cars. The effect of the light is most pleasing, but a considerably larger amount of power is required than for ordinary lighting. The fixtures in Mr. Yoakum's car were supplied by the Safety Car Heating & Lighting Company. Pintsch gas is used as an auxiliary. The car was built at the St. Charles, Mo., plant of the American Car & Foundry Company.

ANNUAL REPORT OF THE INTERSTATE COMMERCE COMMISSION.

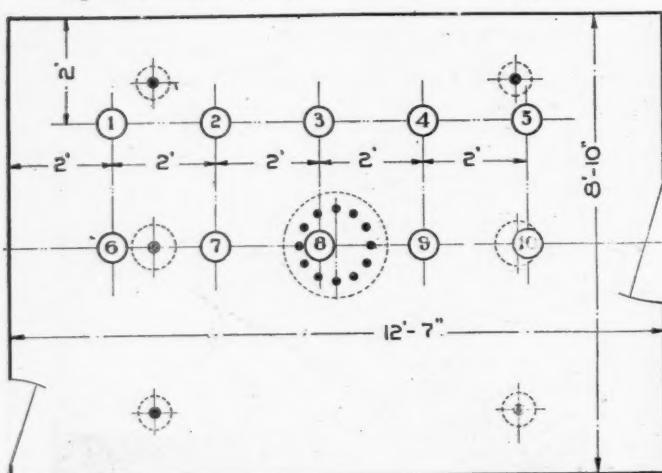
The principal part of the 25th annual report of the Interstate Commerce Commission, sent to Congress, December 20, was abstracted in the *Railway Age Gazette*, December 22, page 1282. In addition to the subjects there dealt with, the report has chapters on the work of the statistical division, on railway accidents, on safety appliances and other matters connected with the physical operations of railways and on a number of minor matters. The chapter relating to decisions of the commission and of the courts contains a list of 62 indictments which have been returned in the federal courts during the past year, and another list of 42 prosecutions which have been concluded during the year. The four cases which have been decided by the Supreme Court of the United States during the year are the following: Against the Delaware, Lackawanna & Western, sustaining the order of the commission forbidding the combining of shipments to make carloads; the Galveston Terminal case, forbidding discrimination by giving exclusive privileges on a wharf; the Willamette Valley case, dealing with shipments of lumber from Oregon to San Francisco, in which the commission ordered a reduction in the rates, although it was admitted that the former lower rates, which were ordered restored, had been unreasonably low; and the Elevation case, dealing with the grain elevators at Council Bluffs, which was noticed in the *Railway Age Gazette* of December 22, page 1294. The principal cases which have come before the commerce court are described at some length.

The Division of Carriers' Accounts during the past year has made extended investigations in the offices of the larger trunk lines and of the 13 large express companies; and the accounts of industrial railways have been investigated. Switching and terminal railways are now being investigated. The commission believes this work to be highly useful.

There is a chapter on shippers' claims, setting forth, in some detail, how some railways do injustice by slow and unbusiness-like methods and also how unlawful advantages are given to shippers by the allowance of claims unjustly large.

During the fiscal year ending June 30, 1910, the railways of the country paid out in settlement of claims for loss of or damage to freight the sum of \$21,941,232. For the year before that the sum was \$25,000,000, and the year before that \$27,500,000. The 1910 sum mentioned amounted to 1.1 per cent. of the total freight revenues. Thus, while the percentage appears to be diminishing, the commission thinks there ought to be a further reduction. It is hoped that in co-operation with the Freight Claim Association an improvement can be effected. Discussing undercharges and other loose practices, the commission suggests that Congress make it compulsory for the carrier to collect full charges, say within 90 days, and, if not collected within that time, it shall be deemed guilty of giving a rebate to the shipper. It appears that cases have arisen where the shipper was called upon more than two years after the delivery of goods to pay an amount in addition to that paid at the time of delivery.

The compilation of the annual reports of the railway companies for the year ending June 30, 1910, is now in the hands of the printer. A preliminary report for the year ending 12 months

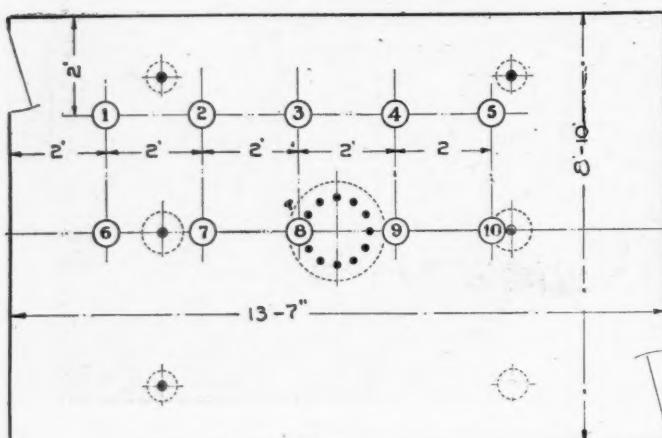


Plan of Observation Room Showing Where Illumination Readings Were Taken.

ILLUMINATION IN DINING ROOM, USING TWELVE 15-WATT TUNGSTEN LAMPS.

Station.	Foot Candles.	Station.	Foot Candles.
1	1.60	6	1.82
2	2.02	7	2.50
3	2.20	8	2.20
4	2.20	9	2.50
5	1.68	10	2.55

Average, 2.06 foot candles.



Plan of Dining Room Showing Where Illumination Readings Were Taken.

ILLUMINATION IN DINING ROOM, USING TWELVE 25-WATT TUNGSTEN LAMPS.

Station.	Foot Candles.	Station.	Foot Candles.
1	1.81	6	2.10
2	2.30	7	2.95
3	2.68	8	3.00
4	2.70	9	3.40
5	1.88	10	3.00

Average, 2.48 foot candles.

ILLUMINATION IN OBSERVATION ROOM, USING TWELVE 15-WATT TUNGSTEN LAMPS.

Station.	Foot Candles.	Station.	Foot Candles.
1	2.26	6	2.43
2	3.20	7	4.20

later (June 30, 1911) for companies having gross annual revenues of \$10,000,000 will soon be issued. This report gives many classes of items which have not been heretofore shown in any of the commission's publications. The number of companies included in this abstract is 62 and they operate 171,745 miles of road.

A table is given classifying the mileage covered by the operations of the 13 principal express companies—whether rail, boat or stage; another table giving the income of the express companies as a whole; and a third giving the revenues and expenses of the Pullman Company from July 1, 1911, to October 31. This department has secured annual reports from electrical interurban railways for four years, and the number of companies reporting is increasing year by year; but as this information is not complete it has been deemed inadvisable to include it in the annual published report. The Division of Statistics has also secured information from pipe-line companies. The commission says that the decision, last October, of the Commerce Court, holding that the commission could not demand from a steamboat company statistics of traffic not subject to the interstate commerce law, will make it impossible to compile useful information from such steamboat companies and will necessitate additional legislation if the commission is to continue the work of developing operating statistics. It expects, however, that the railways will not take advantage of the present situation to interrupt a promising line of statistical work. The railways have made reports to the commission for over twenty years, covering both interstate and intrastate traffic, and they will not take advantage of this court decision allowing them to cut out the intrastate statistics.

The report contains a short chapter on railway accidents, giving the statistics to the end of the last fiscal year, June 30, 1911. These figures were given in the *Railway Age Gazette*, November 10, page 957, in connection with the last accident bulletin. Reference is made to the investigations which have been made of train accidents, but the reports of these accidents are not printed, and nothing is said as to whether they will be. The investigations have generally been conducted by the inspectors of safety appliances "by reason of their special training and peculiar fitness for the work." It is declared that "the construction of cars and locomotives is tending toward an ever-increasing standard of dimensions without a proportionate betterment of track conditions." Statistics are given of derailments during the past ten years which were caused by defects of roadway. The commission recommends legislation looking to the establishment of uniform train rules throughout the country and repeats certain recommendations made by Mr. Belnap in one of his reports of an accident investigation.

Under the head of safety appliances the report says that many of the railways have inefficient inspectors. A review is given of the courts' decisions relating to the safety appliance laws. The commission is gratified to find that the railways are equipping existing cars and engines in accordance with the order of March 13 last, fixing standards of ladders, running boards, brakes, etc., in accordance with the law of April 14, 1910. One company had 4,000 cars equipped within three months from the date on which the law went into effect. During the year suits have been begun to prosecute railways for 23 violations of the locomotive ashpan law, and penalties amounting to \$1,600 have already been collected. The hours-of-service law having been sustained by the Supreme Court of the United States, 153 roads formerly refusing to make reports have signified their readiness to comply with the law. There is a gratifying decrease in the service of men beyond the hours named in the law, but the railways present unreasonable excuses for delays, such as hot boxes, poor coal and couplers pulled out. Sixty-three prosecutions have been begun under this law, and penalties amounting to \$7,526 have been collected. Judge Trieber, in a suit against the Kansas City Southern, has rendered a decision which, if sustained, will do away with these unreasonable excuses. Judge

Willard has held that it is not excusable to detain an engineman or fireman after sixteen hours "to watch the engine"; but, on the other hand, he holds that where a crew remained at a station and neglected to call the telegrapher from his house the company is excusable. As these and other decisions bring out conflicting views, the commission again suggests that Congress make the law more definite and clear.

Referring to the work of the Block Signal and Train Control Board, which has now been in existence four and a half years, the commission says:

"The Board renews the recommendation contained in all of its preceding reports for the compulsory use of the block system on all passenger railways. It concludes that automatic train stops, if properly installed and maintained, will materially contribute to the safety of railway travel. It further concludes that in many situations the use of automatic train stops is urgently demanded. The board is convinced that the principles of design and application of automatic train stops are such that the railways, if required to use them, would find little difficulty in securing appliances of this kind which would meet their operating conditions. The board believes that the railways have been decidedly lax in developing devices of this character. As a consequence of this laxity there has been so little actual experience with such devices on steam surface railroads that the board expresses doubt whether at this time a legislative requirement for the use of automatic stops would be wise. It believes, however, that such action should be taken if due diligence is not exercised by the railways in developing this highly important means of safeguarding railway travel.

"The time has come when something more than mere investigation is necessary, and there should exist some central authority with power adequately to deal with the question of safety upon railways in all its phases. Existing safety legislation does not produce results at all commensurate with their cost. Many matters that have a vitally important bearing upon safety in railway operation are entirely neglected because no adequate means exist for dealing with them. Any future legislation on this subject, to be effective, should deal as comprehensively with the whole subject of the physical operation of railways as existing legislation now deals with the subjects of railway rates and accounts.

"The opinion is expressed that the time has come in this country to inaugurate a system of control over the physical operation of interstate railways similar in character to that now administered through the British Board of Trade. This opinion is not unanimous, however, as one of the board members, Mr. Adams, believes that the establishment of such a governmental agency would be an experiment in an untried field, and holds that action along this line should be deferred until after experts appointed by the government, with power only to investigate and report, have had an opportunity to study the general subject of railway operation."

Following this summary of the views of the board, the commission renews its recommendation of legislation for the compulsory use of the block system, but beyond this makes no recommendations. The views of the board, however, are "entitled to careful consideration." Believing that a temporary board with the limited means available cannot profitably continue the investigations on which it has been engaged, the commission does not ask for an appropriation to continue it beyond the present fiscal year.

The commission on October 3 adopted regulations for the transportation of dangerous articles. These regulations have just been issued (*Railway Age Gazette*, December 29, page 1347). The inspection of locomotive boilers under the law of last February has been begun, and 47 district inspectors have been appointed and assigned to their districts. In the three months following July 1 last, 6 persons were killed and 32 injured by boiler accidents; whereas in the three months immediately preceding that date 12 persons were killed and 260 injured.

Mention is made of the investigation of the derailment on the

Lehigh Valley at Manchester, N. Y., August 25 (the report of which has not yet been issued), and the attention of Congress is called to the need of investigating the causes of rail breakages; but the commission does not desire to make the investigation; there are, doubtless, it says, other bureaus under other departments of the government that are competent to do such work with competent men. The commission thinks that possibly it is desirable to require from the railways comprehensive reports of wheel failures; and that the manufacture of wheels as well as of rails ought to be investigated. The commission repeats the recommendation made to Congress on February 22 last, in response to a resolution of the Senate, that the use of steel cars in passenger trains be made compulsory after a suitable interval, say ten years.

The commission summarizes its recommendations as follows:

1. That section 6 of the act be amended to require telephone, telegraph and cable companies to publish, file and post tariffs, and to empower the commission to reject and refuse to file any schedule tendered for filing which has the effect of exceeding the number of supplements or the volume of supplemental matter permitted under the commission's tariff regulations.
2. To make the Elkins act applicable to telephone, telegraph and cable companies.
3. That the stimulus of requirement be applied to the long-delayed progress toward the adoption of a uniform classification.
4. To provide additional safeguards in railway transportation for employees and the public: (a) By standardization of operating rules of all interstate carriers; (b) by requiring the adoption of steel cars, postal, baggage and passenger; (c) by amending the hours-of-service law, making clear the proviso in section 3

of the act; (d) by legislation requiring the use of the block signal system.

5. That the commission be relieved of the jurisdiction of the physical operation of street railways in the District of Columbia.

6. To provide for the regulation and control of capitalization and suitable provisions for the valuation of railway property.

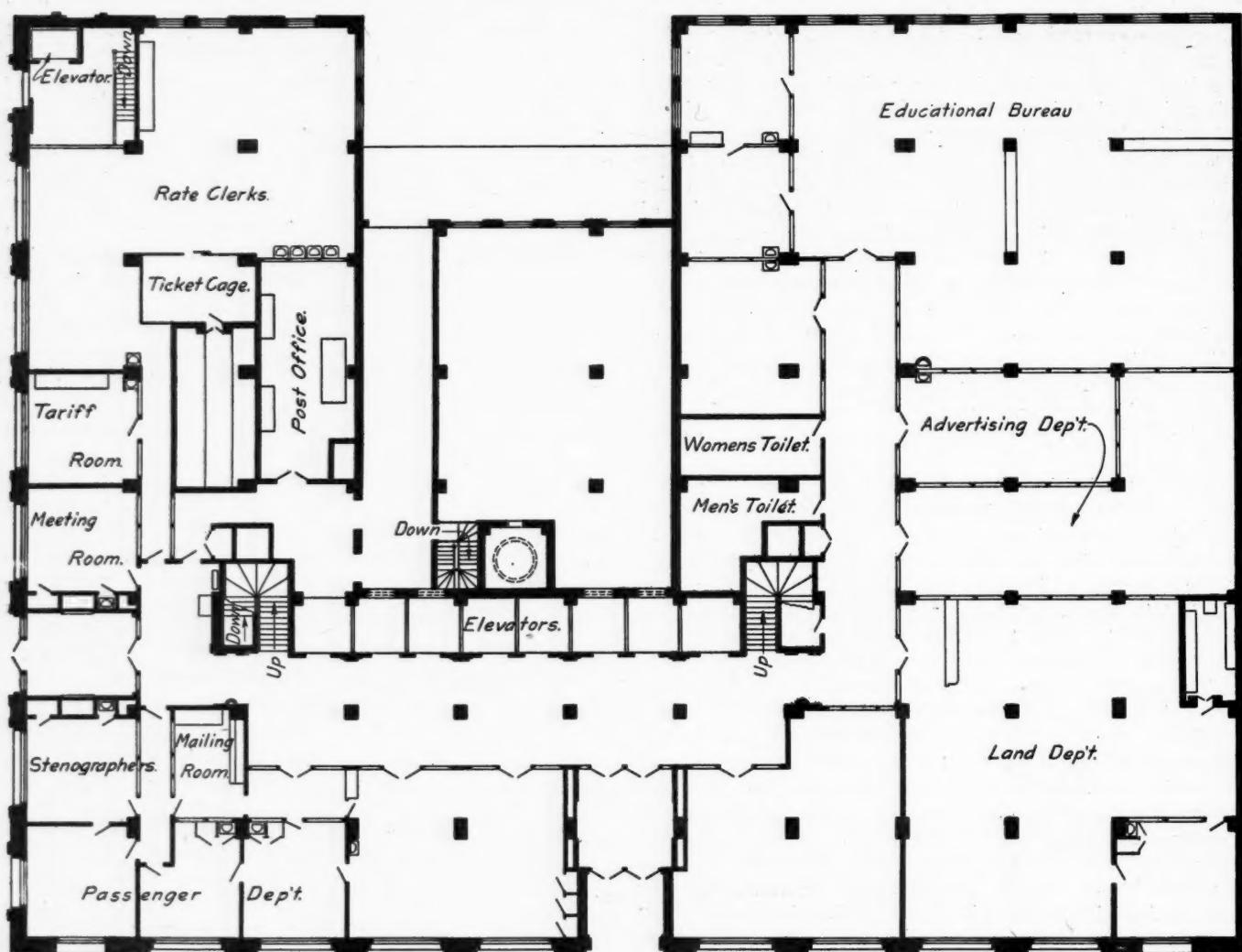
7. The construction of an adequate and suitable office building for the use of the commission.

NEW GENERAL OFFICE BUILDING OF THE UNION PACIFIC AT OMAHA.

The new general office building of the Union Pacific, located at Fifteenth and Dodge streets, Omaha, is completed except for some interior finishing and other minor details which are expected to be finished by January 15. The general officers with their entire office forces have already moved in and the building has been occupied since October 25.

This building consists of twelve stories and basement, having a frontage of 199 feet on Dodge street and 146 feet on Fifteenth street, with a court 50 by 90 feet. It is of the latest type of construction, and is provided with every modern convenience.

The building is of modern fireproof skeleton steel and tile construction, with Maine granite for the base, the first three stories being in Bedford cut stone, and the upper stories gray pressed brick with terra cotta trimming. All floors are of six-inch reinforced concrete, which when tested with loads of 250 lbs. per square foot showed deflections of less than 7-32 in. The foundation is of concrete, 3,100 cubic yards of



First Floor Plan; Union Pacific Office Building.

which were used in its construction, and is supported on piling.

This building contains an average of 21,000 sq. ft. of floor space per floor, of which 17,000 sq. ft. will be used for office space and 4,000 sq. ft. for hallways, elevator, stair space, etc. The building is lighted by over 1,000 windows. The accompanying plan of the first floor shows the general arrangement. There was used in construction of the headquarters, exclusive of the foundation, 500 bbls. of cement, 27,000 tons of structural steel, 1,600,000 common brick and 800,000 face brick.

The lower halls are of Colorado polished white marble; the upper halls have tile floors, and all casings, counters and wardrobes are finished in mission oak.

The building is heated with a modern steam heating plant,



New Union Pacific General Office Building.

three 250-horsepower boilers with patent automatic stokers being used for this purpose.

A modern ventilating system has been installed with power fans operated in the basement of the building, and an improved refrigeration system will be used for cooling all drinking water used.

No expense has been spared by the management to provide pleasant and comfortable offices for its employees, and to give them every modern convenience. The building is equipped with a vacuum cleaning plant. A pneumatic tube system for the transmission of papers, letters and telegrams from one department to another has also been installed, and a package of papers up to two and one-half inches in diameter and ten inches long can be transmitted by way of a central station at the rate of about 90 ft. per second. This is the Universal pneumatic system, and operates entirely by vacuum.

On March 31, 1911, 2,761 miles of railway were open for traffic in New Zealand, as against 2,717 miles the previous year. The net earnings per average mile on lines open in 1911 were \$2,114, as compared with \$1,944 the previous year. The net earnings per train mile for the past year were 70 cents, as compared with 66 cents the previous year. In addition to \$486,000 to be expended during the next four years on grade-reduction work alone on government railways, other contemplated large expenditures are covered in the loan bill which has passed the New Zealand parliament providing authority for raising \$2,430,000 for railway construction and \$1,458,000 for additional rolling stock.

RAILWAY BONDS AND NOTES.

BY WILLIAM Z. RIPLEY,
Professor of Economics, Harvard University.

The most striking feature of all funded indebtedness, as contrasted with capital stock, its high degree of localization. A railway company's share capital represents the equity—that is to say, the surplus value over and above its debts—of all its property as a unit. There is no differentiation of real estate from wharves or bridges, rolling stock or marine equipment. The capital stock comprehends the whole within its range. Bonds, on the other hand, are evidences of borrowing upon the security of *particular possessions*. Any specified stretch of mileage, any bridge, ferry or machine shop, even franchises or traffic agreements may be separately mortgaged. And such property, thus covered by a loan, remains the sole security for the payment of interest or discharge of principal at maturity. This is a feature of great importance to investors, seldom appreciated until bankruptcy throws it into strong relief. Such multiplicity of distinct loans, each secured by a separate piece of property, tends to become more and more accentuated with the age of the road, especially in the case of companies with a checkered and precarious past. The funded indebtedness of the Reading company affords a good illustration of such financial complexity carried to its extreme limits. Not alone the financing of its coal properties in addition to its railway lines; but repeated bankruptcy and reorganization over a long period, have contributed to this result. The best illustrations of the financial intricacy of such railway bonded indebtedness is afforded by the excellent series of maps in White & Kemble's Atlas of Railway Mortgages. Map 19 in this volume, for example, shows that on the main line of the Philadelphia & Reading Railroad between Philadelphia and Mount Carbon there are no fewer than ten distinct bond issues. These are secured in every conceivable way. They cover different stretches of road, ranging from 54 to 116 miles in length. Some are convertible; some are consolidated; some are improvement bonds. Some are confined to the main line, others spread out over the many branches of the road. They overlap and interlock in the most complicated fashion. They vary in rates of interest, in term, in provisions as to trusteeship and foreclosure. Detailed examination of such a map demonstrates more clearly than in any other way this leading financial principle, that mortgage indebtedness of a railway is a matter not of corporate unity, but of particularity to the last degree.

The American practice of financing by means of mortgages of specific property has had important results, especially with rapidly growing systems. For even in normal cases, the path of localized borrowing once entered upon, must be pursued to the end. Thus a mortgage upon a hundred mile operating division or upon a given bridge immediately stands in the way of any general lien upon the property of the company as a whole. These local liens, by taking precedence over any subsequent ones, render their security less sound. Such prior liens must first be extinguished, or else, for that property thus already embarrassed, the succeeding loan becomes a "second mortgage." And yet such practice is inevitable in any expanding system. Any general mortgage upon the entire property immediately becomes a partial or localized one after new construction or consolidation with other properties has taken place. Simple financing is possible only in these rare instances where all increments of capital for extension or improvement are obtained from new stock issues or from surplus income, reserved from dividends for the purpose. In all other instances, companies are hampered in contracting fresh loans. Previous borrowings may be far less than the value of the property, yet specific first mortgage security for any but particular bits of possession may be hard to find. The cost of such piecemeal finance is surely greatly enhanced as a result.

As an extreme instance of the highly specialized character of a bond issue, an experiment upon the St. Louis & San Fran-

cisco Railroad in 1904 may be cited. This company had acquired a large part of the capital stock of the Chicago & Eastern Illinois in order to obtain an entrance into Chicago. Funds for this purpose were borrowed upon the stock deposited as collateral, with an agreement to pay 10 per cent. dividends upon it, until finally redeemed at \$250 in 1942. Meantime the "Frisco" was sadly in need of funds to meet costs of improvement and extension. No tangible property remained unmortgaged. The expedient was therefore adopted of making a traffic contract between two subsidiary roads, the St. Louis, Memphis & South Eastern, and the Chicago & Eastern Illinois, on terms peculiarly favorable to the former road, and then to base a mortgage upon this profitable contract. In other words, by this arrangement one controlled road was given an advantage over another; and the profits from this agreement to the former were promised as interest upon a \$16,000,000 bond issue by this company. Fixed charges of nearly a million dollars were thus created, which of course had to be raised at the expense of the other party to the contract, the Chicago & Eastern Illinois. Such charges became a prior lien upon earnings ahead of the guaranteed dividends upon the capital stock. The legality of this arrangement was called in question in court proceedings. Aside from its legality, however, the case is significant as illustrating the possibilities of highly specialized borrowing in case of need.

A mode of simplifying an already very complex scheme of borrowing has been to put forth new consolidating, unifying or general bonds. These are supposed to represent the aggregate equity over and above all previous borrowing. Such an issue would necessarily provide funds for retiring all prior liens as they fall due. Theoretically this plan would in time substitute one "blanket" loan for a multiplicity of localized ones. And where they are issued by a system, which, by reason of consolidation of separate properties, has greatly enhanced revenue power, they would seem to be warranted. But unfortunately in practice many old bondholders may decline to exchange their prior liens; so that the net result is merely the addition of another "junior" security to the long list.

All authorities upon railway finance have emphasized the fallacy of the view that a mortgage is really secured by any specific piece of property. In ordinary real estate or commercial practice this is indeed true. But the theory is entirely inapplicable to a railway. Few of its separate possessions are in and of themselves of a worth equal to the face of the loans based upon them. It seldom happens even that the entire property can be sold for enough to satisfy the face of its outstanding obligations. The separate units to a far higher degree have no value except as part of a going concern. No matter how much a bridge or a terminal may have cost, its value depends upon use. And railways are peculiarly economic units from an operating point of view. The right of way is not even fit for farming land when trains cease to run. Rails become scrap iron. Rolling stock and movables alone can be auctioned off piecemeal fashion. The real lien of a railway mortgage, therefore, is not upon property as such, but upon earning power. And earning power is dependent upon such efficient operation as can alone take place when each separate possession can be treated as an integral part of the whole. The inherent weakness in the prevailing theory is revealed whenever the test of bankruptcy is applied.

The main purpose served by the right of foreclosure in funded indebtedness is that it may compel a financial reorganization of the company. This is an operation of the utmost delicacy in view of the conflicting interests involved; and the number of these is often very great. In the Union Pacific reorganization of 1895, there were no less than fifteen separate official committees, each representing many separate issues of securities. The Atchison in 1889 had to readjust the interests of 41 distinct groups of bondholders. Only a few of the senior issues could be satisfied by an outright foreclosure sale. All the rest would have their equities extinguished by such drastic procedure. Their safety lay in continued operation of the property as a

whole, with such postponement or proportional reductions of their claims as could be agreed upon among themselves. The former of these two courses is the one usually adopted. New securities, with interest returns, not fixed as before but contingent upon earnings as they appear in future, are commonly exchanged for the old ones on which default has occurred. And it is an odd circumstance, shown by long experience, that the company, having failed because of its overload of capitalization, usually emerges from its reorganization with a larger volume of securities than ever. This is due to the fact that dissenting bondholders can be tempted to acquiesce in the new plan, only through offers of larger par values than before, as an offset for the postponement of their claims on current earnings. As Daggett, the prime authority upon reorganization, aptly observes: "There is a magic in the par value stamped upon a certificate which affords a certain consolation to those from whom sacrifices in interest are demanded. An unimpaired (usually increased) principal, moreover, constitutes a real advantage when the date of maturity arrives."

There are many other practical details as to the issue of bonds which may be merely mentioned in passing. It goes without saying that the price at which such securities may be sold depends upon two factors: first, the amount issued in relation to the property upon which it is based; and secondly, the interest promised in relation to the prevailing market rate. The best test of normality is that the bonds shall be salable at par at the going interest rate. If a higher rate than this is necessary to hold them at their face value, it is an evidence of weakness. And, of course, the issue of bonds at a discount is an expensive and wasteful proceeding, even at best. For all such securities at maturity must be paid off at par, and any larger principal sum to be paid at that time than was realized at the date of issue is a positive loss. Sometimes this may be offset by a saving in the current rate of interest paid. Issuance at a discount may at times be necessary in order to strengthen the appeal to investors, who commonly prefer to buy at what seems to offer somewhat of a bargain. But by and large there can be no doubt that the soundest financing is characterized by such adjustment of principal and interest as shall enable emission at somewhere near par value. It should also be understood that the value of a bond depends in a measure upon the length of its life. This follows directly from the fact that the premium or discount at its issue has to be pro-rated over the ensuing period of years. The preference of investors for long term bonds, which offer some opportunity of a rise in price because of the expected fall in the general rate of interest, is another factor to be reckoned with. It commonly leads to somewhat higher quotations relatively to their interest rate, for long-term securities. Such details, however, appertain to private finance rather than to the public aspects of the question. They are fully described in the standard hand books on the subject.

The actual differentiation of funded indebtedness of American railways into various classes of securities is shown by the following table from the official Statistics of Railways for 1909:

Mortgage bonds	\$6,942,000,000
Collateral trust bonds	1,147,000,000
Income bonds	284,000,000
Debentures, notes, etc.	803,000,000
Miscellaneous	316,000,000
Equipment trust bonds	308,000,000
Total	\$9,801,000,000

It may next be in order to describe the essential features of some of these types of indebtedness.

The income or preference bond is a form of security devised largely in connection with the widespread reorganizations of 1893-7. Disappointed bondholders were induced to accept them in exchange for their old securities, the companies meantime being relieved from the burden of fixed charges by the promise to pay interest only on condition that it was earned. It seeks to combine the lien of a mortgage with the contingency of interest payment if earned. It differs thus from preferred stock, in the

addition of a prior claim upon assets in case of bankruptcy. Attaining a considerable volume ten years ago, the amount of such issues has not greatly increased in recent years. As has been observed, the income bond "is an attempt to combine two contradictory commercial principles. . . . Security for both interest and principal is the essence of the creditor's position, while contingency depending upon success is the essence of the stockholder's position." The two interests are incompatible and conflicting. Experience has proved this to be the case. Stockholders, controlling management, have it in their power to devote all surplus earnings to maintenance and improvement, rather than to pay interest upon the bonds. The property is thus built up until both stock and bonds may be able to participate in earnings alike. Meantime, however, the income bondholders have been deprived of revenue. Nor can they ever recoup these losses of interest, as might happen in the case of cumulative preferred stock. Interest lost for one year is gone forever. The notable suits of the Central of Georgia income bondholders under the Harriman régime, settled in 1910, clearly demonstrate the nature of the difficulty inherent in this class of security. One party wished to buildup the property by devoting large sums to maintenance, even concealing revenue from its subsidiary company, the Ocean Steamship Company, and otherwise juggling its accounts. The bondholders demanded proper consideration of their rights and eventually secured it.* If, on the other hand, as in the Reading reorganization, this contingency is guarded against, the trust agreements may be so rigid as to embarrass the management in securing further loans needed for development. Nor has the conferring of voting power upon income bondholders solved the problem satisfactorily. As a matter of fact, such securities are scarcely distinguishable from preferred stock; and recent financing has tended frankly to recognize that situation.

The close similarity between income bonds and preferred stock is exemplified by a recent contest between shareholders on the St. Joseph & Grand Island.† The Union Pacific practically controls this small company, through ownership mainly of its common stock. It is in position to make good use of its property as a short line between important points. Net earnings of the road have in the past been substantial, sufficient, in fact, to pay the full dividend upon the first preferred shares. And during eight years of control by the Union Pacific, approximately four million dollars of such earnings have apparently been put back into the property in the form of improvements. Inasmuch as the preferred stock is non-cumulative as to dividends, this entire diversion of earnings into betterments entails an irreparable loss to the holders of this class of stock. On the other hand it immediately inures to the benefit of the Union Pacific, by hastening the time when the common stock, by reason of enhanced earning power may be placed upon a dividend basis. Meantime, it is alleged, the Union Pacific is quietly picking up the preferred shares at low prices conditioned by the cessation of dividends. Whatever the actual merits of the case, the issue raised as to the differentiation between income and capital, or improvement, account is precisely analogous to that raised by the Central of Georgia income bondholders, referred to in a preceding paragraph.

A special variety of bond, more common in England than in the United States, is known as a debenture. This is practically a bond without a specific mortgage lien, and hence without foreclosure power. In other words, it is merely a promise to pay, depending for security upon the general credit of the road. In one respect the debenture resembles an income bond, in that interest is contingent upon earning power. Being thus, in form at least, somewhat less secure than an ordinary mortgage bond, some other attractive feature, such as convertibility into stock, or a higher rate of interest, is necessary in order to insure its

successful flotation. On the part of the company, the advantage is clear, inasmuch as debentures may be issued irrespective of the amount or nature of the prior liens already outstanding. Some strong companies like the New York Central & Hudson River and New York, New Haven & Hartford, have largely relied upon debentures in recent years. But in the case of weaker companies, like the Wabash, large issues of such securities have been at once a source of disappointment to investors, and an embarrassment to the future financing of the road itself.‡

Short time borrowing by railways may be for several purposes, quite different in character and significance. Notes may be issued merely in order to anticipate assured income, as cities or towns frequently do, in order to cover current expenses until receipts from taxes suffice. Such financing is purely normal and requires no comment. Or notes may be emitted under financial stress by companies struggling on the verge of bankruptcy. In this case the episode is abnormal, and usually merely postpones the evil day of reckoning. A third cause of short-time borrowing has within recent years assumed such proportions as to demand careful examination. Such borrowing for short periods of time threatens to disturb the general money market as well as the supply of long term bonds. It is commonly associated with periods of financial disturbance, arising naturally of course in a tight money market when ordinary bonds are unsalable at any fair price. Every crisis since 1878, with the exception of the distinctively railway panic of 1884 has witnessed this phenomenon. But it has steadily assumed larger and larger proportions; and seems to be less critically regarded than heretofore. This is probably due to the fact that it is now resorted to by the strongest and most conservative railways; whereas it was formerly only a device for staving off impending bankruptcy of railways of the weaker sort.

As a device for merely postponing trouble, note issues are in bad repute. The Jay Cooke flotation of Northern Pacific notes just prior to financial collapse in 1872 was almost identically repeated twenty years later on the eve of the panic of 1893. The floating debts of important railways ran up by \$124,000,000 at this time. The most prominent examples were the Union Pacific collateral trust notes of 1891-4, and those of the Northern Pacific and the Atchison. In all three cases, the notes falling due in a panic period precipitated bankruptcy. But the subsequent resort to note issues at the two periods of financial distress of 1903 and 1907 have been due to entirely different causes. They represent forced borrowing, of course, for it is inconceivable that any company should pay high rates of interest for short loans, if regular bonds could be sold. But the significant feature is that they now represent true development work, rather than impending bankruptcy. Note financing has assumed a positive rather than a merely negative character. Nor is the amount of such borrowing inconsiderable. It has been estimated that in 1903-4 not less than \$200,000,000 of short time notes were issued; while within the first five months of 1907, the aggregate loans of this kind were \$285,000,000. During the latter period regular bonds amounting to less than \$200,000,000 were sold by railways. In other words the half year's financing was predominantly of this temporary sort. The average rate of interest has also risen. In 1903-4 it averaged about 4.5 to 5 per cent. Three years later it was between 5 and 6 per cent.

The particular causes of these later note issues were the imperative need of improved facilities for handling the enormous growth of traffic; and also to some degree the exhaustion of the regular supply of loanable capital for financing stock market operations incident to the spread of consolidation. The freight blockade of 1899 was mainly due to insufficiency of equipment to handle the business offered. The trouble in 1903 was inadequacy of terminals. Many large companies, notably the Pennsylvania, had in consequence committed themselves to large projects of terminal development. These commonly proved more costly than was anticipated; and moreover the panic of 1903 interrupted

*Described in detail in Quarterly Journal of Economics, XXV, 1911, p. 396 *et seq.*

†The U. S. Investor for January 21, 1911, p. 115, reprints the statement of the aggrieved preferred shareholders.

‡Succeeding articles will treat of collateral trust and convertible bonds.

them midway in construction. The work could not be interrupted without loss upon all the investment already made. It was imperative to go on at all cost. Bonds could not be floated. Notes were a last resource. It must be added, however, that other causes were also contributory. While the Pennsylvania was making extensive terminal improvements in 1903 at New York, it was also, with the Lake Shore road, engaged in buying up the stock of the Philadelphia & Reading in order to steady both the trunk line and hard coal situations. This latter factor was less in evidence in 1906.

As for the outcome of these stupendous note issues, it is unfortunate perhaps that in the main it was successful. In other words, the notes were mainly paid off by means of the proceeds of regular bond issues, after the lapse of from one to three years. The issues of 1907 in fact were in some cases actually bought up by the companies themselves in advance of maturity. Surplus funds drawing only 2 per cent. interest., could profitably be devoted to this purpose. The leading exception was the Erie, which was barely saved from default and another bankruptcy by the intervention of Mr. Harriman, when its notes fell due in 1908. The fact, however, that in most cases these notes happened to fall due at times when the needs of the companies could be permanently cared for, does not detract from the possible danger lurking in their use. If they chance to mature at an inconvenient time, the situation may easily become desperate, and the cost of such hand-to-mouth finance is always bound to be excessive.

From a wider point of view the seriousness of this tendency to resort to short term financing is that it withdraws from trade the floating supply of capital. This in turn leads to drafts upon the available long-time investment funds of the community for the daily needs of business. In other words extensive note issues discourage, if they do not preclude, ordinary borrowing by means of long-time bonds. The appeal is usually to the large sources of ready capital. Until the reform of the New York life insurance companies, they invested heavily in such notes. They are commonly in large denominations for the convenience of such lenders. The notes used more commonly to be secured by deposit of collateral, ordinarily free holdings of stocks or bonds of subsidiary companies. But many in recent years are issued upon the mere credit of the company, being otherwise unsecured. Many are thus rendered semi-speculative in character. This naturally leads to wide fluctuations in value. It is sometimes difficult to separate such liabilities from the ordinary funded debt. They should always of course be regarded as current liabilities, of the nature of floating debt. But in 1910, leading companies like the Erie and the Baltimore & Ohio, failed to so designate them. This is a most deceptive practice. On the whole, viewing the developments of the last decade, one is almost tempted to hope that a sharp lesson or two may serve to remind railway financiers of the risks incident to the growth of this short-note habit.

ANOTHER VIEW OF THE SUPPLY DEPARTMENT PROBLEM.

The comments on the supply department of "D. A. D." in one of his "Letters of an Old Railway Official to His Son, a General Manager," recently published in the *Railway Age Gazette*, continues to call forth discussion from the supply department. The following letter from "K. I. D.", who in real life is the general storekeeper of a large railway, has been received under the title, "A Heretofore Unpublished Letter from a General Manager to His Father, a Retired Railway Official."

ON LINE, August 3, 1911.

MY DEAR D. A. D.:

Your letter of July 22 from Salt Lake City was received in due time, but I have not had a good opportunity to reply to same on account of being so very busy. I have also deferred answering as I hesitated to say to my fond old *pater* just

what I wanted to say, and thought possibly by putting it off I might decide not to write it, but I still feel the same, and must get it out of my system.

Now you know, D. A. D., that I have the greatest respect for you and your opinions, and I owe everything to you. I certainly miss seeing you, and I read all your letters from all over the country with great interest, and I derive much benefit from them, though sometimes I differ in opinion from you, and do not follow your advice. (By the way, D. A. D., now that you've retired and are well fixed, why don't you settle down and give mother a little more benefit of your society? If you don't you soon must be a *tired* "retired railway official.")

But I can't bring myself to agree with you on the stores department proposition. You have been out of the active service now for some time, and I believe have not kept fully posted as to the progressiveness of this branch of the service. You know, D. A. D., that it has been pretty hard for some of the old fellows to give up the old practices, and a few of them never will until they're "born again." I say all this with due respect to you, and I hope you won't get miffed at what I say, and take a trip to the coast to settle your nerves.

It's a poor father who does not make his son show up an improvement over him, and each successive generation should be better. That this is so is the highest encomium on our ancestors. Grandfather always wore boots. You discarded them after a hard struggle, and the only ones I ever wore were the red top ones I wore when a boy. Now, you know, D. A. D., you can run faster in light shoes than you can in boots. The railways are metaphorically shedding their boots, and newer methods are in vogue and younger men are at the helm. Why, at my age (and I mention this only as an example in point, and not egotistically) you were still general foreman at the Glendale shops. You didn't have an electrically driven machine in the shop, never heard of a superheater, and if a Mallet engine had run into the shop (which would have been impossible on the 40-lb. rail, and on account the size of the roundhouse), you would have been scared to death.

But these things all came, and with each one of them there were calamity howlers, and it was hard to give up the boots.

The same way with operating practices. After you became superintendent of the old road, which you know was only two hundred miles long, you made the purchases of material. When the road was absorbed by, and made a grand division of, the trunk line, you were made general superintendent, but were relieved of the buying, and this was done by the purchasing agent. I remember well your howls at this innovation, and I note even yet, in your letter, you say "the purchasing for a large railway *may* warrant a purchasing agent," implying that you are still unconvinced on this point. But is there any big road without a purchasing agent?

And now the stores department looms up as a bugaboo. It is young yet, but it is not a helpless infant. It has gotten out of long clothes and is making great headway, and in my opinion is bound to be the prime factor in the proper handling of the supply question on all railways. This has already been demonstrated on many systems, and is being worked out satisfactorily on the majority of the lines. But right here I want to say that the management should not inaugurate a stores department, appoint a general storekeeper, tie his hands and feet, throw him in, and tell him to swim. I am not going into the matter of organization, but I do say that the stores department should be given the proper recognition by the management, the general storekeeper vested with the necessary authority, and given pay roll allotment adequate to enable him to employ men of suitable caliber to successfully operate his department.

The storekeepers are making good showings for their companies, and it is not done by reducing their stocks to a working basis so low as to be unsafe and uneconomical.

fact, however, that the criterion of the ability of a storekeeper is the percentage of his issues of material to his stock on hand, provided always that he carries sufficient stock to meet promptly all reasonable demands upon him for supplies.

I cannot imagine a case of a superintendent having to beg a storekeeper for any material. Regardless of the system in operation, the superintendent and storekeeper should work together for the railway, and with us I know they do. If in any case they do not, it is not the fault of the system, but an evidence that the storekeeper or the superintendent or both should be removed.

The storekeeper can be an invaluable aid to the superintendent or higher official in keeping check of the materials both before and after issue, and he is in a better position to do this than the superintendent is. A bona-fide order is necessary now to get material from the storehouse, and the storekeeper is supposed to account properly for all material used. This was not exactly the case at Glendale, when the general foreman had the stock. Don't you remember, D. A. D., when you persuaded the superintendent of motive power to let you rebuild the 627? You gave an estimated cost of \$7,000, and when completed our charges ran up to \$8,700. Don't you remember when you told Wilson, the so-called storekeeper (who, by the way, got \$45 a month), to shave the charges to the 627 down to \$6,930.78, and charge the difference to repairs of freight cars, as that account would stand it? Don't you remember when they had the big political celebration in Glendale, and you loaned the committee two hundred lanterns, and gave them a barrel of carbon oil? We got back part of the lanterns and no oil, and the shortage you had charged to "O. T. & W. for locomotives." (I hesitate to mention the mahogany sideboard which mother still has.) I could enumerate lots more, but you know them. This would be harder to work under the stores department system, and that's one reason why some of the old fellows kick.

You refer to two prominent roads which do not have the stores department system and two others which do have it. Before I inaugurated the system on our lines, I personally visited all of these roads and made careful investigation, and I want to say it was principally due to my investigation of these particular lines that I started our department, and I have not had cause to regret it. When the hard times struck us all a few years ago, one of the roads without a stores department, which you mention, had such a heavy stock on hand that it practically made no purchases for about a year. During the period of depression and low-priced material it was using up its high-priced stock accumulated during the fat years. The other road, with a stores department operated on a good basis, continued to purchase material monthly as needed, *at low figures*. This is a eulogy on the system.

But I am drawing this out too long, I fear, and will close after relating a coincidence, or you might say "two." Aunt Mary has been visiting us for the past week, and you know some of her ideas are as strenuous as yours, although along different lines. Whenever she is with us on Sunday, I always brush up and go to church with her, just like it was my regular habit. I went twice last Sunday. Now, don't laugh yet. In the morning the minister's text was Deut. xxxii, 15, "But Jeshurun waxed fat, and kicked." He took as his theme the fellow who couldn't stand prosperity, and incidentally took a few knocks at the fellow who had everything his own way, and then kicked when finally he was compelled to give something up. On the way home, Aunt Mary said, "I wish your father could have heard that sermon."

In the evening the minister had a composite text from Zech. iv, 10, "For who hath despised the day of small things," and Ps. cxviii, 22, "The stone which the builders refused has become the head stone of the corner." When he con-

cluded I couldn't help thinking, with apologies to the old nursery rhyme,

Hush, little Storekeeper, don't you cry,
You'll be somebody by and by;

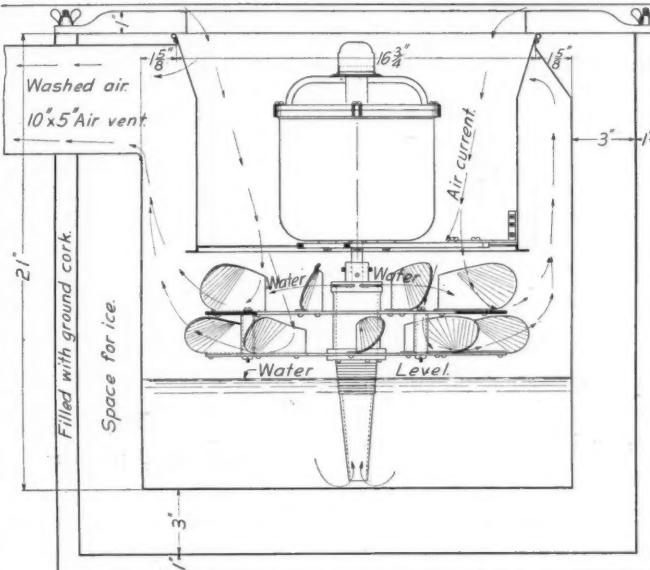
and mentally I joined with the pastor when he said "Let us pray."

Now, take this all kindly, my dear old D. A. D., and believe me to be your affectionate son.

K. I. D.

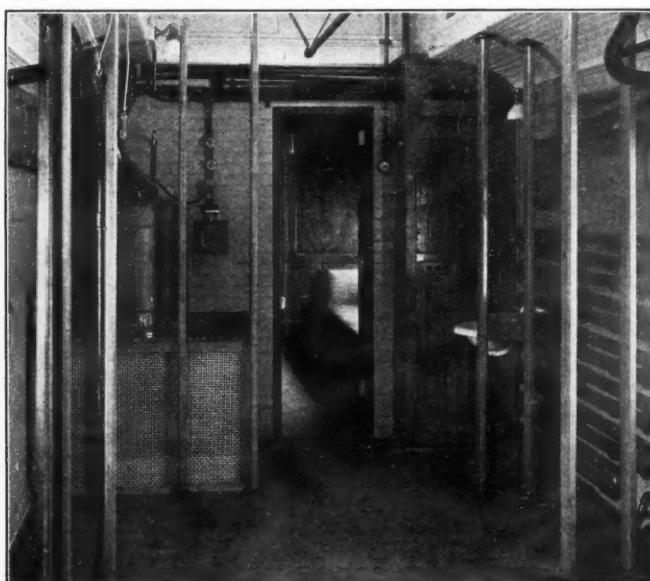
AIR WASHER AND COOLER, SANTA FE TRAIN DE LUXE.

In the description of the Santa Fe "Train de Luxe" in the *Railway Age Gazette* of December 15, reference was made to a recently invented air-cooling and air-washing device, which is intended to be used when the trains are passing through the hot, desert portion of the line. This device was made by the Duntley



Air Washer and Cooler for Passenger Equipment.

Manufacturing Company, Chicago, and a section of the apparatus is here illustrated. It consists of an inner case or tank surrounded by a 3-in. ice space, which in turn is insulated by an outer case, leaving a space 1 in. wide, which is filled with granu-



Application of Air Washer and Cooler to Baggage End of Buffet Car.

lated cork. A Burke electric motor is suspended in the sheet iron drum with the fan below. It is specially wound so as to operate on a 30-volt, direct current and consumes 242 watts when running at full speed at 1,200 revolutions per minute. The fan is 16 in. in diameter and consists of a horizontal ring $2\frac{3}{8}$ in. wide and a solid disc below, on both of which are riveted curved vanes.

Below the fan and fastened to the motor shaft is a conical tube which projects into the water; its rapid revolution causes the water to rise in the tube, and it passes out through a narrow slot in a fine spray near the top of the fan. Outside air is admitted through the central portion surrounding the motor and passes to the fan, where it is cooled, moistened and washed by the cold water spray, and then passes out through ducts in the lower deck of the car. It is admitted to the body of the car through ornamental registers, about 8 in. in diameter, placed in the headlining of this deck. The air washer is located in a small closet at the end of the dining and sleeping cars, and its general appearance, as fitted in the baggage end of the buffet car, is shown in the photograph. When operating at full speed each air washer supplies about 90,000 cu. ft. of air per hour to each car, which insures ample ventilation. It should add greatly to the comfort of passengers passing through a hot, dusty region, as the air supplied to the cars will be free from dust, cinders and other impurities, and will be cooled through the medium of the water spray aided by the ice jacket.

STREET MECHANICAL STOKER.

A description of the Street mechanical stoker was published in the *Railway Age Gazette* of May 26, 1911, page 1197. Since that time an improvement has been effected in the design and construction of the conveyor used for moving the coal from the tender to the elevator hopper beneath the frame of the locomotive. The natural construction of such a conveyor is to use the screw type, but so long as the stoker was expected to feed everything from run-of-mine to slack, such a machine was inapplicable to the work. Something not apt to jam was needed. But if

prepared—that is, crushed—coal is used, then the screw conveyor can be employed.

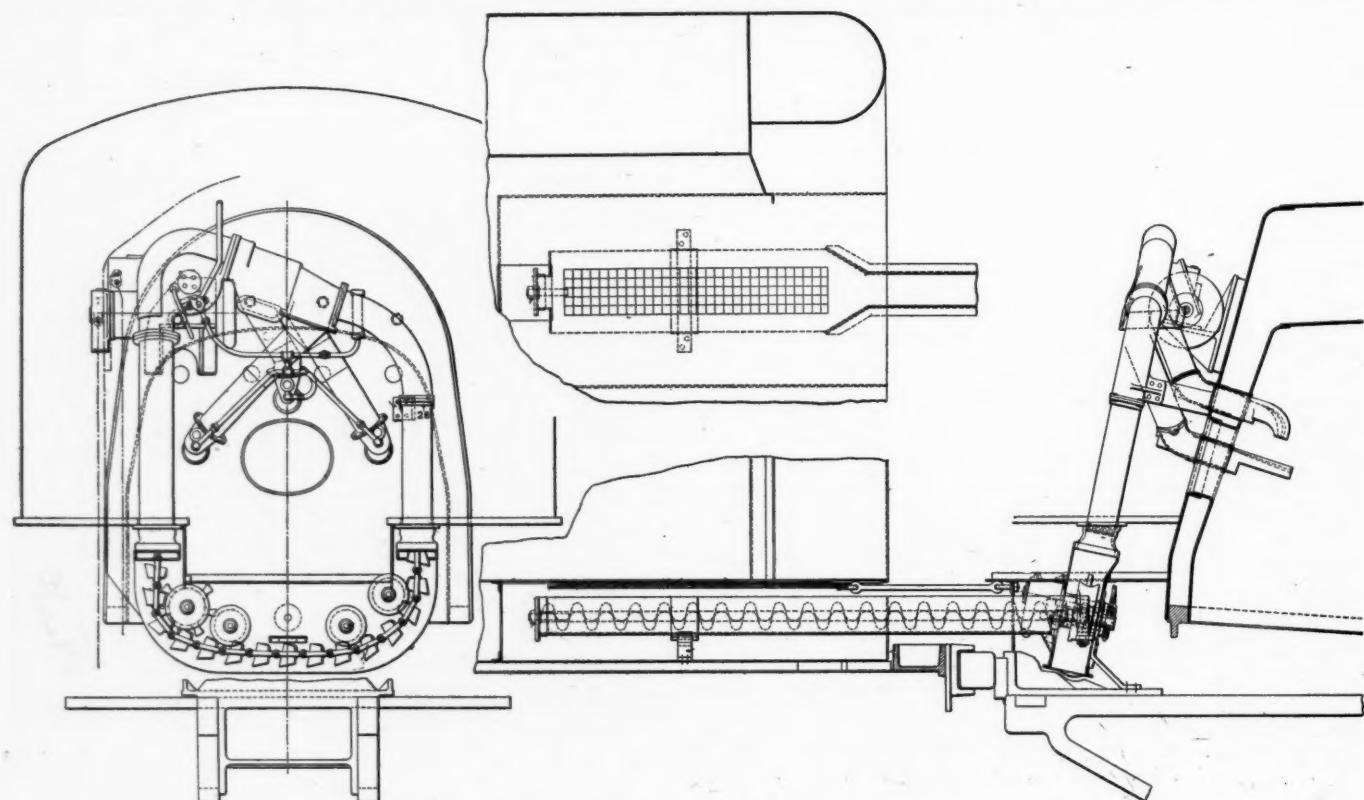
Mr. Street has always insisted that the coal used in his stoker be crushed before delivery to the distributing nozzles, and, to that end, put a crusher on the tender, not that he approved of it, but because railway officials were not educated to the point of preparing coal for stoker use. With the crusher, the fireman has to rake down all the coal to the stoker jaws, from which it drops into a chute delivering into the deep hopper below the conveyor. This crusher is driven by an engine of its own located on the tender and taking steam from the locomotive. This arrangement was made to meet requirements and will be abandoned as soon as officials are educated to the point of recognizing the advantages of using one crusher at the coaling station instead of one on each of the locomotives.

In the previous article the four-fold screen in the elevator pipe was described, which, by turning, can throw any one of four grades of crushed coal down at the back head. It was not illustrated at the time and is, therefore, shown here.

With crushed coal furnished to the tender, a screw conveyor is used to carry it to the elevator hopper. Its general arrangement is shown in the accompanying engravings. The second engine, that was located on the tender, has been dispensed with, and the screw conveyor is driven by a sprocket wheel mounted in the lower hopper, and in turn driven by the elevator chain.

The screw runs back from the hopper beneath the floor of the tender, as shown in the illustration. It lies in a heavy sheet iron trough, which is pivoted on a strong pin to the hopper. The back end of the trough rests on a wrought iron support bolted to the floor of the tank. A double toggle joint is provided for driving the screw, and this together with the pivot connection for the trough makes ample provision for passing around curves and over uneven track.

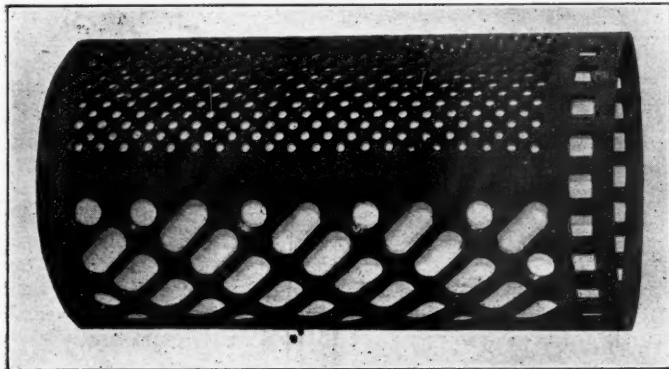
A screen having 2-in. square meshes and made of $\frac{1}{4}$ -in. wire is placed directly above the screw conveyor and in the floor of the tank. This screen is covered with sliding plates, which plates are arranged so an opening 10 in. by 12 in. is the maximum which can be obtained, and this opening is always in front of the coal, and therefore at a point where it can be seen by the fireman.



General Arrangement of Screw Conveyor Type Street Locomotive Stoker.

The screen has a sliding support in the tank and is provided with an agitator which keeps it in constant motion while the locomotive is running, and prevents the coal from bridging and clogging over it. When taking coal these plates are placed in a position which covers the entire screw, and prevents any coal from being fed to it until such time as the fireman is ready for this to be done. He then moves the front plate ahead, uncovering the opening beneath it, and allowing the coal to flow down upon and through the screen until the slope will deliver no more. The second plate is then drawn out against the first, thus moving the opening to the rear. The other plates are afterwards moved in succession to meet the demands of the fire until the last plate has been drawn out and the tender has been emptied.

With the stoker and crusher combination as described in the former article, the lower hopper was very deep so as to obtain a sufficient steepness of slope for the chute to cause the coal to flow under all circumstances. With the screw conveyor the lower hopper is located between the floor of the cab and the deck casting. A section of the cab floor is made removable, and by lifting it access is obtained to all parts of the lower hopper. This hopper is provided with movable slides to facilitate cleaning it out, and is also fitted with a steam jet for blowing in steam to thaw it out in case of freezing. When the screw conveyor is



Discharge Pipe Screen.

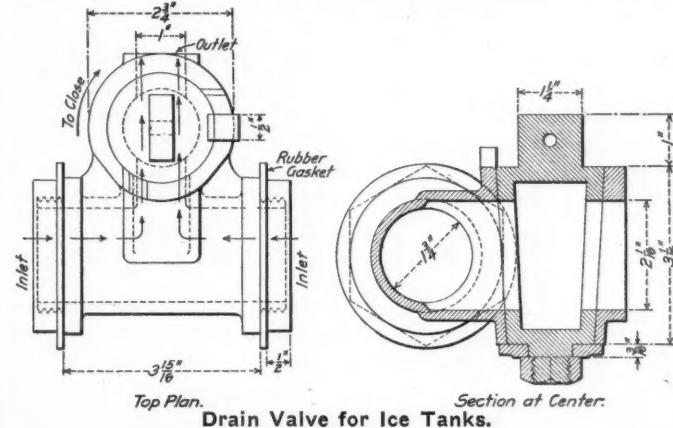
used it is possible to construct the tank of such a form that all of the coal can be taken from the tank and fed into the firebox without being handled by the fireman. Under the most unfavorable construction of the tank the only handling of the coal required on the part of the fireman is that of scraping it out of the sides of the tank on top of the screen when the coal supply is low or nearly exhausted. The agitator prevents bridging, and the only attention the screw must receive from the fireman is that of occasionally drawing out one of the plates which cover the screen, bringing the opening further back. With this type of stoker the amount of coal fed to the firebox is governed by the speed of the screw conveyor, which is regulated from the fireman's seat.

The elevator engine and elevator run at a constant speed, and a gear changing box is provided, by means of which three different speeds can be given to the screw conveyor. The operating handle for this gear changing box is located at one side of the fireman's seat, to enable him to change the speed of the screw, and therefore the amount of coal fed to the firebox without leaving his seat. The gear changing box is mounted directly on the shaft of the driving sprocket, and motion is transmitted from the box to the screw through the medium of a link chain and a pair of sprocket wheels. The balance of the stoker remains as it is used in connection with the crusher, and as described in the previous article.

The chamber of deputies of Bolivia has passed a bill authorizing the government to ask for tenders for the construction of a railway from Quiaca, Argentina, to Tarija, Bolivia, a distance of about 104 miles. There will be a guarantee of 5 per cent.

TANK VALVE FOR REFRIGERATOR CARS.

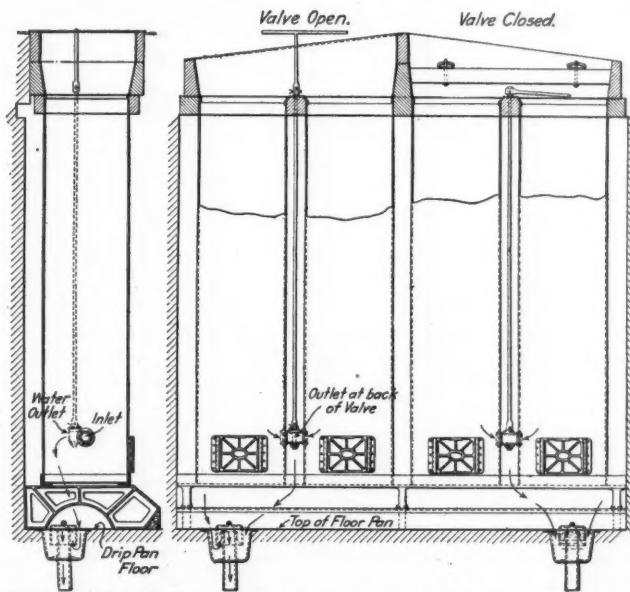
The M. C. B. committee on brine drippings from refrigerator cars recommended, at the 1910 convention, that all salt water from melting ice should be retained in the ice tanks and drained only at icing stations, because the sprinkling of the salt water over the road was a serious cause of the corrosion of steel road structures and rails; also that the mechanism for operating the draining valves should be simple and positive. Many of the packing companies have equipped large numbers of refrigerator



Top Plan. Section at Center.
Drain Valve for Ice Tanks.

cars with drain valves, in accordance with these recommendations, which are opened only at ice stations. The illustrations show the general arrangement and detail of a drain valve as designed and patented by the Haskell & Barker Car Company, Michigan City, Ind.

The brine tanks are arranged in pairs, and the valve with a flange connection made tight with rubber gaskets is placed between each pair. The connecting piece is 1 1/4 in. inside diameter, and the plug valve body is cast solid with it, providing a clear opening 2 1/16 in. in diameter. The entire fixture is made of brass; the plug is ground in to fit and is operated by a rod extending to the handle at the top of the car. The overflow



Refrigerator Car Ice Tanks Equipped With Draining Valves.

brine passes down to the floor drip pan, and is delivered to track through the usual traps. Morris & Company have used these valves in their refrigerator cars for a year, and report them to be uniformly successful. They have had no trouble with them freezing, and they stop the dripping of brine on the track. All the brine is carried in the tanks and is emptied only at icing stations. The overflow pipe in the tank is placed so high that even when all the ice is melted the opening is still above the water level.

General News Section.

The Missouri Pacific has ordered a reduction in force and working time in the shops at Sedalia, Mo.

Telephone train despatching circuits are being installed on the Chicago Great Western, between Kansas City, Mo., and Des Moines, Ia.

Suit has been started in the federal court at Salt Lake City against the Oregon Short Line for five violations of the hours-of-service law.

The Baltimore & Ohio Southwestern was fined \$300 in two cases in the federal court at Cincinnati on December 28 for unduly detaining live stock in cars in violation of law.

The Atchison, Topeka & Santa Fe has abolished the use of flags as markers for the rear ends of passenger trains, and the lamps (unlighted) will serve as markers during the day.

By agreement between R. T. Railey, general attorney of the Missouri Pacific, and Attorney-General Major of Missouri, the cases against the Missouri Pacific and the Missouri, Kansas & Texas, involving the validity of the state law requiring railways to pay employees twice a month, have been advanced on the docket of the Missouri supreme court for hearing at the January term.

A statement compiled at the War Department in Washington shows that from sales of scrap iron and other unused material which was left on the Isthmus of Panama by the Frenchmen who did work on the canal fifteen years ago, the government has already realized the sum of \$2,112,000. Over 29,000 tons of metals from these abandoned plants have been shipped to the United States, and there is much work yet to be done. Some of the abandoned machinery has been put in order and is being used.

The Illinois Central has offered a reward of \$1,000 for the arrest and conviction of the persons responsible for attempts to wreck four suburban passenger trains in the vicinity of Grand Crossing and Parkside, Chicago, on the night of December 26. Three of the trains were derailed, but no one was injured. Suspicion has rested on men involved in the recent strike of shop employees of the company, but no clew has yet been developed. An investigation showed that the switches had been tampered with. Fourteen sticks of dynamite were also found under the approaches of the railway bridge across the Mississippi river, used by the Illinois Central and other lines, at Thebes, Ill.

The railroad commissioners of Nevada, H. F. Bartine, J. F. Shaughnessy and W. H. Simmons, have addressed to the senators and representatives of congress from that state, a petition for the abolition of the commerce court and for the enactment of a law to carry all disputed decisions of the Interstate Commerce Commission direct to the supreme court of the United States. The honorable commissioners have printed their petition in a pamphlet of 8 pages, and they evince no disposition to mince words. The commerce court is nothing more nor less than a second commission. Important cases are sure to be appealed. If the court holds invalid an order of the commission, in the great majority of cases "it is morally certain that the court will be wrong and the commission right." The Interstate Commerce Commission is experienced and competent and it is absurd in all cases and a rank injustice in many to require its action to run the gauntlet of two courts. The inferior courts are slow and much injustice is done by delays. The procedure in many cases is "both strange and objectionable in the highest degree." Many courts "refer cases to irresponsible but ambitious masters in chancery." The master sets up his opinion against that of the railway commission, federal or state, and the court then adopts the presumption that the master is right, both in his findings of fact and conclusions of law. This is productive of untold evil. The petition goes on to cite cases illustrating this and other points.

The Uruguay Great Eastern Railway has been authorized to open to public service its completed extension from La Sierra to Maldonado, and the government has approved the plans of the

Central Uruguayan Railway Company for its new station at San Jose. The company will commence the construction of this station at once.

Rules for B. & O. Claim Agents.

General Claim Agent Egan, of the Baltimore & Ohio, has formulated a code of business ethics, and has forwarded a copy of it to each claim agent. Following are extracts:

"Be polite and kind to the poor. . . .

"Do not be deceitful. Tell the truth and take your medicine; it is better for your conscience, the company and your fellow men.

"Be honest. Because a claimant is poor, do not take advantage of him nor his condition.

"Be frank in all things. If a claimant asks your advice, give it openly and freely. If your advice is not taken, your duty has been done.

"Be courteous. Do not endeavor to create the impression that you own the road.

"Be ever patient. If a claimant vilifies you and says all manner of things against you, treat him with all the politeness and kindness you possess, and ere the day has passed he will bemoan the fact that he made an ass of himself."

Illinois Central Pensions.

Figures compiled by the pension department of the Illinois Central show that during the period of 10 years—July 1, 1901, to June 30, 1911—534 employees were pensioned, exclusive of a number of men to whom special allowances were granted in lieu of pensions on account of their not being technically eligible to a pension under the rules. The names of 364 men were on the pension roll on June 30, and the pension roll as of that date was at the rate of \$95,429 per year. During the 10 years' operation the company paid out \$511,664 in pensions, not including special allowances.

An examination of the pension records show many interesting features. An agent at a comparatively small station, 53 years continuously in the service in the same capacity, receives a pension of \$47.57 a month for the rest of his life. A tinsmith, 53 years continuously in the service, receives \$40.32. A laborer, 52 years continuously in the service and whose wages were always necessarily below the wages of men of skilled trades, receives a pension of \$32.08. An engineman is receiving a pension of \$80.13 a month; another engineman has been paid \$5,932.80 during the 10 years he has been carried on the pension roll. The figures do not include the Yazoo & Mississippi Valley.

Bureau of Safety Organized on Chicago Great Western.

H. J. Slifer, general manager of the Chicago Great Western, has issued a circular announcing the establishment of a bureau of safety along lines similar to the safety committees on the Chicago & North Western, Frisco and other roads, for the purpose of studying methods of minimizing the risk of accidents to employees and the public. An executive safety committee has been appointed consisting of: Hiram J. Slifer, general manager; J. G. Neuffer, superintendent of motive power; L. C. Fritch, chief engineer; G. O. Perkins, superintendent of telegraph; Dr. G. N. Wassom, company surgeon; J. H. Ambruster, chairman educational committee, which will have full jurisdiction over the operations of the bureau. Division safety committees will be appointed on each operating division to be composed of the division superintendent, engineer maintenance of way, master mechanic, trainmaster and chief dispatcher. The chairman of each division committee will render a monthly report to the executive committee. Similar committees will be appointed by the executive committee for general office headquarters at Chicago. Transportation safety committees will be appointed by division safety committees and will consist of five members each, representing enginemen and trainmen. Mechanical safety com-

mittees will be appointed by division safety committees and will consist of five members each, representing roundhouse men, coaling station men, cinder pit employees.

Locomotives on the Erie with Two Whistles.

The Erie Railroad has equipped about 100 of its locomotives, running in suburban passenger service at the New York end of the road, with 2-in. single-bell chime whistles, in addition to the ordinary whistle, and has instructed the enginemen to use this smaller and less noisy whistle on all occasions except where the louder one is required as a measure of safety. All of the engines in the New York suburban service, about 175, will soon be equipped. The whistle valve is controlled by a flexible wire which extends from the front to the back of the cab, within easy reach of the engineman and in close proximity to the pull which actuates the larger whistle and which is of a different form. Some of these smaller whistles have been in use for several months, and officers of the road find them satisfactory in every respect.

As a local report well says, those suburban residents who have been disturbed and annoyed by the "wild shriek" of the 5 a. m. train may now be expected to become fast friends of the Erie. This is a good way of making friends, or at least of making things tend in that direction.

Government Control of Interstate Mercantile Affairs.

Charles Nagel, Secretary of Commerce and Labor, in his annual report recommends direct supervision by the federal government of all mercantile and manufacturing enterprises whose business is subject, or legally can be made subject, to the United States government. He says:

"A certain degree of combination of capital is admittedly essential to the carrying on of our great business enterprises. To control properly such necessary combinations we must have some administrative federal office or commission which shall make this work its business. We must have a permanent authority which shall by steady and continuous supervision and publicity safeguard the public interests and at the same time allow full scope for necessary and proper business efficiency and development."

"The decisions of the Supreme Court in the Standard Oil and American Tobacco Company cases have brought forcibly to the public attention a fact repeatedly presented in the reports of this department—the imperative need for the positive administrative regulation of great industrial corporations.

"The recent decisions, and the reorganizations which followed, have made it clear that another imperative step remains to be taken, and that this is the establishment, by appropriate legislation, of a broad system of supervision and publicity for all those industrial and commercial organizations engaged in interstate and international business.

"Whether this shall be done by means of federal incorporation or by a federal office or commission exercising powers of regulation and supervision may be a secondary question. The first consideration appears to be the establishment of permanent administrative publicity, regulation and supervision. The time is peculiarly ripe for such action. Public opinion and the views of many corporation managers are as one."

Railway Storekeepers' Association.

The ninth annual meeting of the Railway Storekeepers' Association will be held at Buffalo, N. Y., May 20-22. The standing committees are as follows:

Committee on Recommended Practices—One year, H. C. Pearce (Sou. Pac.), H. C. Stevens (Nat. Rys. of Mex.), T. W. Flanagan (M. St. P. & S. S. M.); two years, C. C. Dibble (L. S. & M. S.), E. J. McVeigh (Grand Trunk), J. W. Foyle (M. K. & T.); three years, J. H. Waterman (C. B. & Q.), George Holmes (Mich. Cent.), W. L. Cooper (M. & O.).

Committee on Piece Work—D. C. Curtis (C. B. & Q.), J. W. Gerber (Sou. Ry.), B. W. Griffith (L. S. & M. S.).

Committee on Scrap Classification—D. Kavanagh (R. I. Lines), E. J. Roth (C. B. & Q.), C. C. Dibble (L. S. & M. S.), H. A. Anderson (Penna.), W. F. Girten, Scranton, Pa.

Committee on Accounting—D. A. Williams (B. & O.), E. L.

Fries (Harriman Lines), F. R. Brown (C. B. & Q.), W. H. Grassman (N. Y. C. & H. R.), E. E. McCracken (B. & L. E.).

Committee on Uniform Grading and Inspection of Lumber—J. H. Waterman (C. B. & Q.), J. R. Mulroy (St. L. & S. F.), W. F. Jones (N. Y. C. & H. R.), N. M. Rice (A. T. & S. F.).

Committee on Standard Grain Door—D. Kavanagh (R. I. Lines), E. J. Roth (C. B. & Q.), W. A. Summerhays (Ill. Cent.).

Committee on Membership—N. M. Rice (A. T. & S. F.), E. E. McCracken (B. & L. E.), J. H. Callaghan (Can. Pac.), H. S. Burr (Erie).

Committee on Stationery—H. E. Rouse (C. G. W.), N. A. Waldron (St. L. S. W.), E. E. Herold (B. & O.).

Committee on Standardization of Tinware—J. R. Mulroy (St. L. & S. F.), H. C. Pearce (Sou. Pac.), J. H. Waterman (C. B. & Q.), F. D. Reed (C. R. I. & P.), H. A. Anderson (Penna.), W. F. Jones (N. Y. C. & H. R.).

American Supply and Machinery Manufacturers' Association.

The next joint convention of the American Supply and Machinery Manufacturers' Association, the National Supply and Machinery Dealers' Association and the Southern Supply and Machinery Dealers' Association will be held at the Monticello hotel, Norfolk, Va., May 13-15, 1912. F. D. Mitchell is secretary and may be addressed at 309 Broadway, New York.

American Society of Mechanical Engineers.

The American Society of Mechanical Engineers will hold a meeting of members resident in New York on January 9, to consider the work of the society.

American Association of Demurrage Officers.

The annual meeting of the American Association of Demurrage Officers will be held at San Francisco, Cal., May 10-11, 1912.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.; annual, May 7-10, Richmond, Va.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass.

AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York; next convention, Seattle, Wash.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill.; annual, June 18-21, Chicago.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew building, Cincinnati, Ohio; 3d Friday of March and September; annual, March 17, Chicago.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOC.—George Keegan, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Convention, 3d week in Oct., Baltimore, Md.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, Monadnock Block, Chicago; annual convention, March 19-21, 1912, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOC.—J. W. Taylor, Old Colony building, Chicago. Convention, June 17-19, Atlantic City, N. J.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—M. H. Bray, N. Y., N. H. & H., New Haven, Conn.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.

AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wemlinger, 13 Park Row, New York; 2d Tuesday of each month, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; annual, June 26, 1912, Quebec, Que.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago; annual convention, May 22, 1912, Los Angeles, Cal.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 135 Adams St., Chicago; annual, June 24, 1912, New York.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conrad, 75 Church St., New York.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—D. F. Jurgensen, 116 Winter St., St. Paul, Minn.; 2d Monday, except June, July and Aug., St. Paul.

ENGINEERS SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va.; annual, May 15, Buffalo, N. Y.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11 Brussels; 1915, Berlin.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, Brown Marx building, Birmingham, Ala. Convention, July 23-26.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio. Convention, August 15, Chicago.

IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August, Des Moines.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York; annual convention, May 14-17, Pittsburgh, Pa.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago. Annual convention, June 12-14, Atlantic City, N. J.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Convention, 2d week in September.

NATIONAL RAILWAY APPLIANCES ASSOC.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.

NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.

NORTHERN RAILWAY CLUB.—C. L. Kennedy, C. M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.

OMAHA RAILWAY CLUB.—H. H. Maulick, Barker Block, Omaha, Neb.; second Wednesday.

RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 2 Rector St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOC.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.

RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis, Mo.; annual, May 12, 1912, Kansas City, Mo.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio. Convention, May 20-22, Buffalo, N. Y.

RAILWAY SUPPLY MANUFACTURERS' ASSOC.—J. D. Conway, 2135 Oliver Bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. assocs.

RAILWAY TEL. & TEL. APPLIANCE ASSOC.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.

RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling; September, 1912, Buffalo, N. Y.

ST. LOUIS RAILWAY CLUB.—B. W. Fraumenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.

TOLEDO TRANSPORTATION CLUB.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.

TRAFFIC CLUB OF CHICAGO.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 18, 1912, Louisville, Ky.

TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y.; August, 1912.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Wednesday in month except July and August, Chicago.

WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md.; annual, January 16-18, Chicago.

Traffic News.

The Southern Demurrage and Storage Bureau, with headquarters at New Orleans, La., was dissolved on January 1.

The Chesapeake & Ohio and the Toledo, St. Louis & Western have arranged to take freight through between Cincinnati and St. Louis, the junction being at Marion, Ind. The train schedules provide for second morning delivery of freight at both cities.

The Missouri, Kansas & Texas has granted the Oklahoma City jobbers and manufacturers storage and transit rate privileges on car load shipments from factories to points in Oklahoma on farm implements, gasoline engines and harvesting and threshing machinery.

A special meeting of the Central Passenger Association was held in Chicago, December 27, for the purpose of considering a plan of abolishing as far as possible all special certificate plan and convention rates below 2 cents a mile, with the exception of Niagara Falls excursions and similar rates which have become established. Further consideration will be given to the plan at a meeting on January 10.

The Atlantic Express Company is the name of a corporation which has been formed to conduct an express and baggage transfer business in Boston and other New England cities, and also in New York. The name of William Loeb, Jr., collector of the port of New York, is given as one of the directors of the company; and F. B. White of Boston, is general manager. The new company will buy the Hoyt-Tarbox Express Company, of Boston.

During the week preceding Christmas, the Chicago & North Western "entertained" at its new passenger terminal at Chicago 318,000 people; that is to say, that number passed through its doors; the number of pieces of baggage handled was 24,190, and 12,370 persons were served in the lunch and dining room. This is an increase in passengers and baggage of 20 per cent. over the corresponding week of 1910 at the old Wells street terminal.

At a meeting of a joint committee representing eight business men's organizations of Cincinnati, held on December 27, a resolution was passed attacking the present rates of the Cincinnati Southern for the transportation of certain manufactured articles from southern points to Cincinnati as being unfair and discriminatory. A copy of the resolutions was mailed to each of the trustees of the Cincinnati Southern, demanding a readjustment of the rates.

Exporters in New York City report that to many destinations they are now obliged to pay for ocean transportation fully double the rates demanded last summer; this in consequence not only of a general heavy movement of freight from America to Europe, but also because of heavy movements in other parts of the world. Freight from Europe to America has not increased so largely, but the steamships have announced that the rates will be increased in the near future.

T. O. Plunkett, the head of the cotton culture department of the Southern Railway, now has thirteen men traveling among the cotton planters of Alabama, Mississippi and other states traversed by the Southern Railway and its affiliated lines, instructing and assisting the farmers in combating the cotton boll weevil. The Southern Railway proposes not only to do what it can in exterminating the weevil, but also to give suitable information to the farmers in those regions where it has not yet been found, with a view to preventing its spread.

L. L. Fellows, commercial agent of the Lake Erie & Western at Indianapolis, was elected president of the Indianapolis Transportation Club at the annual business meeting of the club. Other officers were elected as follows: First vice-president, H. C. Shepard, division freight agent, Pennsylvania Lines; second vice-president, S. S. Shambaugh, assistant treasurer Kokomo Wire & Steel Company; third vice-president, E. C. Merritt, traffic manager Indianapolis Abattoir Company; secretary-treasurer, L. E. Stone, agent Central States Despatch.

Frank Foster, commissioner appointed by the supreme court of Kansas in the mandamus action brought by the attorney-general

of Kansas against eight railways entering Kansas City, Kan., and six elevator companies, has filed a report holding that the grain inspection law passed by the Kansas legislature is constitutional; that all grain consigned to and stored in public warehouses at that point is subject to inspection, and that the inspection fees prescribed by the law will not yield a revenue in excess of the necessary expenses of maintaining the department; but that grain entering the terminals and not consigned or stored in the elevators is not subject to inspection.

A revised Western Freight Classification, No. 51, was issued on January 1 to become effective February 15. This latest issue of the classification contains 437 pages as compared with 264 in the last issue, the additional pages having been necessitated mainly by the adoption of the recommendations of the Uniform Classification Committee, published prior to September 1, including reports 1 and 2. The classification has been elaborated in many ways and its rules are made more specific; for example, the old term "not otherwise specified" now reads "not otherwise indexed by name." This is also the first issue of the classification embodying the requirement of the Interstate Commerce Commission that all advances or reductions be indicated.

The Baltimore & Ohio will run an agricultural educational train over its lines in Maryland on five days next week, the lectures being given by professors and teachers from the Maryland Agricultural College, under the direction of Dr. Richard S. Hill, state director of farmers' institutes.

The Pennsylvania Railroad will next week start its fourth annual farmers' educational train in New Jersey, leaving Camden Monday morning and visiting 30 towns. A new feature of the train will be an exhibit car in which the work of the state experiment station at New Brunswick will be shown in the shape of fruit packed for shipment, corn, alfalfa, methods of managing poultry and shipping eggs, and a display of charts. Secretary Dye of the State Board of Agriculture will have with him on the train 15 lecturers and other assistants.

The much regulated Texas railways have recently discovered that even justices of the peace may regulate freight rates in that state, to the extent of overruling rates fixed by the Texas railway commission. In the case of Young vs. Houston & Texas Central the plaintiff secured from a justice of the peace at Hempstead a judgment of \$14 on the complaint that the defendant's rate on a shipment of melons was exorbitant, in spite of the fact that the rate was one promulgated by the state commission. A temporary injunction was secured in the district court, but later dissolved. An appeal was taken to the court of civil appeals at Galveston, which declined to overrule the justice of the peace. Then the supreme court refused to allow a writ of error on the ground that the justices of the peace have authority to pass on cases involving less than \$20.

The Pennsylvania's Agricultural Instruction.

To answer the question, What profit? an officer of the Pennsylvania Railroad has compiled the following information concerning the work of the lecturers which the company has carried over the road during the past three years in its "agricultural specials"; and the results are found to be more definite, and are manifested in a greater number of places, than any one had expected. The pamphlets issued by the company, and its other missionary work, are also found to have been popular and useful.

The members of the Chester Valley Farmers Co-Operative Association declare that that organization is a result of the railway's agricultural work. One of the first undertakings of the association was cow testing, for which a trained man from Pennsylvania State College was secured. There are 450 cows in the herds owned by members of the association.

At Price, Md., there has been organized a "Progressive Farmers' Club." The charter members numbered 35, and they have started a creamery. The object of the club is to study farming industries, improve farm land, and instruct farmers in the placing of their crops on the markets in better shape.

Reports from various points in Pennsylvania show that as a result of the educational work which is being done by the road

many apple and peach orchards have been established. There were received at one station an increase of 1,000 fruit trees in one year over the previous year. Reports from another station show that in 1911 there was an increase of 50 per cent. in car-load apple shipments. At another station the receipt of nursery stock has doubled in the last year, while from another the report states that five times as much nursery stock has been received this year as in any previous year.

A general report from one section of Pennsylvania states that "a large number of old orchards have been renovated, new ones have been planted, and on every hand there is evidence of renewed interest and activity in all lines of farm work upon a more intelligent and scientific basis."

The number of fruit trees in one county in Maryland increased 140,000 in the last few years.

The Fruit Tree Special, operated by the Pennsylvania was in charge of Professor H. A. Surface. There can be no doubt that it actually reached those interested for it was the practice, when this train arrived at a scheduled stop, to take the spraying apparatus, pruning hooks, pots for mixing spraying solutions, and all other paraphernalia at once to an orchard in the vicinity. There the lecturers put on their working clothes and after selecting a good specimen of a tree, pruned and sprayed it themselves in the presence of the owner of the orchard and other farmers. This was done after the spraying solution had been mixed and prepared on the ground by the lecturers.

Indicative of the extent to which the "Soil Fertility" lectures have been effective are the following reports regarding the use of lime and commercial fertilizers:

During the past season 25 carloads of lime have been received at a station where no lime was ever received before. Two stations report an increase of 50 per cent. in receipts of lime. One station reports an increase of 201 carloads of lime in the first eight months of 1911 over the same period of 1910.

Where farmers burn their own lime, all reports show an increase in the receipt of coal used in burning the lime stone. Several lime-burning companies were unable to fill orders this year, whereas in previous years their kilns were shut down part of the time. At one station during the present season 33 persons attended the lectures, each of whom represented a different farm in the vicinity.

As a result of the operation of the educational trains over the Pope's Creek Branch of the Philadelphia, Baltimore & Washington in central Maryland, two dairy farms have been established.

One farmer of central Maryland crossed the Chesapeake bay to the eastern shore in order to attend the lectures given on the train. This same farmer drove 20 miles one morning to the first stopping place of the Special, and remained with it all day in order to hear all of the lectures several times.

Throughout the country districts of Pennsylvania the principles of agriculture form a part of the course of study in the schools. Beginning this year a special coach was added to the trains and at each stopping place the high school class and teacher were given a lecture on home and market gardening. In the final examinations of the year this subject will be given consideration. The Pennsylvania State College authorities state that the enrollment in the school of agriculture has greatly increased in the last few years, and they have no doubt that the educational trains have contributed to the increase.

The company's literature on farming subjects is in active demand among responsible farmers. As many as twenty-five requests for the books have been received at Broad street station alone in one day's mail. The following statement shows the number of the various pamphlets distributed:

Orchard Primer	25,000
Potato Culture	35,000
Seed Grain Suggestions	40,000
Use of Lime on Land	10,000
Essentials of Soil Fertility	20,000
Alfalfa	25,000
Farming Possibilities of Delaware-Maryland-Virginia Peninsula	3,000
Increase of Crop per Acre—Use of Dynamite on the Farm	26,500
Good Roads at Low Cost	35,500

One division freight agent reports:

"A merchant of Lancaster County, who is an intelligent and observing man, has voluntarily stated to one of our agents

that a marked awakening among the farmers in that vicinity has been so noticeable of late that he felt impelled to inquire among the farmers individually as to the cause of their activity and the noticeable changes in their methods for the better; and in every instance it was traced directly to the information they had gained from the pamphlets issued by the Pennsylvania Railroad Company.

"The apparently stolid indifference with which these pamphlets were at first received by many of these people was only temporary. For instance, the pamphlet on the use of dynamite on the farm when first distributed, was the subject of much levity and adverse criticism, but those who scoffed have remained to pray, and everywhere stones, stumps and other obstacles, which have long obstructed and marred the farm are being rapidly eliminated by the intelligent use of dynamite, while sub-soiling is being largely resorted to by the same means."

Good Roads.—Township supervisors located on the Pennsylvania east of Pittsburgh and Erie are using the split-log drag. They all report good results. The railway company built log drags and placed them at several stations for the use of the farmers and others. At no point has the drag been left unused, and requests for more drags are being received. One township supervisor stated recently that in his estimation "no township can be fully equipped for road making without a log drag." This same supervisor was one of the hardest to convert to the use of the drag.

Following a visit of the good roads train, a farmer who heard the lectures made and began to use a log drag on a short stretch of road from his farm to the state road. He was stopped in this work by the township authorities, but he persisted in his efforts, using the drag after dark. After a few nights' work, the effects of his labor were seen and he was then allowed to use the drag. Since that he has had numerous requests for the loan of his drag, and others have been built.

A number of farmers living in the neighborhood of one of the points at which the good roads train stopped built drags and used them on the roads in front of their farms. In this way an excellent road was built for a distance of nine miles into one of the principal towns of the county. During the tour of the good roads train more than 75,000 people heard the lectures and viewed the exhibits.

INTERSTATE COMMERCE COMMISSION.

An investigation by the Interstate Commerce Commission of the subject of allowances paid by railways to industrial railways serving steel plants, is to be opened at a hearing in Chicago on January 27 before Commissioner Harlan.

The "Greater Des Moines" committee of Des Moines, Ia., has petitioned the Interstate Commerce Commission for a reduction in class rates between Des Moines and points in Colorado, Utah and Wyoming, alleging discrimination as compared with the rates between Chicago and those points.

The Brunswick-Balke-Collender Company has petitioned the Interstate Commerce Commission to cancel the rule of the Western Classification Committee, under which an extra rate is applied to articles too large to be loaded through the side door of a 36-foot car, or too long to be loaded through the end window.

The Louisiana railway commission has filed a complaint with the Interstate Commerce Commission asking a suspension of tariffs advancing the freight rates on potatoes from points in Louisiana to points in Texas from a range between 31½ and 40 cents to a range between 44 and 49 cents, effective February 12. The state commission alleges that the rates will work an unjust discrimination against Louisiana potato growers on account of lower rates from Texas points to Louisiana.

Discrimination Against Sioux City.

Traffic Bureau of the Sioux City Commercial Club v. Chicago & North Western et al. Opinion by Commissioner McChord:

Class rates from Sioux City, Iowa, to southwestern Minnesota found unreasonable to the extent that they exceed the rates from St. Paul and Minneapolis to equidistant points in the same territory. (22 I. C. C., 110.)

Complaints Dismissed.

J. P. Wadell Show Case & Cabinet Co. v. Michigan Central et al. Opinion by the commission:

Complainant's shipments were properly rated as "in crates" under western classification. (22 I. C. C., 106.)

Gamble-Robinson Commission Co. et al. v. St. Louis, Iron Mountain & Southern. Opinion by the commission:

Rates on watermelons from southeastern Missouri to Minneapolis, Minn., and St. Paul are not found unreasonable. (22 I. C. C., 138.)

Bewsher Co. v. Union Pacific. Opinion by the commission:

A rule requiring those doing business with the Union Pacific to sign a voucher on receipt of money, showing their relationship to the corporation or firm for which they take the money, is not found to be unreasonable. (22 I. C. C., 146.)

Georgetown Railway & Light Co. v. Norfolk & Western et al. Opinion by the commission:

Differences in transportation conditions justify a different rate on Pocahontas coal from West Virginia to Georgetown, S. C., from the rate on the same coal to Charleston, S. C. (22 I. C. C., 144.)

Carload Rate Established.

Red Path-Vawter Chautauqua System v. Atchison, Topeka & Santa Fe et al. Opinion by the commission:

At present the complainant is charged L. C. L. rate on its tents, poles, camp chairs, etc., for Chautauqua entertainments. The commission holds that Chautauqua outfits should be given a C. L. rate with a minimum weight of 20,000 lbs. (22 I. C. C., 135.)

Live Stock Rates Reduced.

In re alleged unreasonable rates and practices in the transportation of live stock, packinghouse products, and fresh meats from various Southwestern points to packing houses, and from thence to various destinations. Opinion by Commissioner Prouty:

The defendants' present rates upon live stock from points in New Mexico, Texas, and Oklahoma to Fort Worth, Tex., Oklahoma City, Okla., and Wichita, Kans., are unreasonable and are hereby reduced. The defendants' present rates on fresh meats and packing-house products from Fort Worth, Oklahoma City, and Wichita to various points are unreasonable and are reduced.

As the record contains nothing which indicates clearly the points to which the rates on tankage are desired, nor the nature of the complaint against the rates now in effect, no opinion on that point is at this time expressed. For reasons expressed in the report, no opinion is given on the rates on hides involved in this case. The defendants' present rate on salt from the Kansas field to Oklahoma City is unreasonable to the extent that it exceeds the rate prescribed in this report. (22 I. C. C., 161.)

Reparation Awarded.

Sunderland Brothers Co. v. Missouri Pacific et al. Opinion by the commission:

Carload rates on brick from the Kansas gas belt to points in Iowa found unreasonable to the extent that they exceed rates from the same points to Mississippi river territory. (22 I. C. C., 141.)

Under the present ruling of the commission, if, of two competing through carriers, one has a combination of intermediate rates less than the through rate, such carrier may reduce the through rate, and if such carrier happens to be the short line, the competing carrier or carriers may reduce their through rates without an application to the commission; but if such carrier does not happen to be the short line, the other roads have to make a special application to the commission to reduce their rates. The commission believes that railways now competing under equal rates should be allowed to continue their competition until special cases can be passed on by the commission, and therefore has ordered that where the through rate has been reduced, roads maintaining through rates via other routes between the same points may meet the reduction, although discrimination

against intermediate points is thereby increased. When the commission, however, specifically passes on any application for permission to charge less for the long haul, the order will automatically cancel the permission now granted in general.

The commission has extended from January 1 to May 1, 1912, the date at which its orders ruling that the tariffs which show a higher rate to intermediate points simply because the intermediate points are not either consuming or producing points, shall be corrected so as to show the same rate to intermediate points. The extension of time was granted because of the amount of labor involved in correcting the tariffs.

Rate on Lemons Again Reduced to \$1.

Arlington Heights Fruit Exchange et al. v. Southern Pacific et al. Opinion by Commissioner Prouty:

The defendants in 1904 made a blanket rate of \$1 per hundred pounds for lemons from southern California to all territory east of the Rocky Mountains, and advanced this rate in November, 1909, to \$1.15. The commission in 19 I. C. C., 148, while holding that a rate of \$1.15 on oranges was liberal, reduced the rate on lemons to \$1. The Commerce Court granted an injunction against the enforcement of this order of the commission on the ground that the commission was attempting to protect California lemon growers against Sicilian competition, regardless of the reasonableness of the rate itself. The Commerce Court, in its opinion, pointed out that the commission had apparently attempted to overcome tariff insufficiencies by lowering the transcontinental freight rate. The commission did not attempt to do this. Had the commission understood that the Commerce Court would attempt to look into the mind of the commission for the purpose of ascertaining the reasons on which its order was based, that the mere statement of the claims of the parties was to be taken as evidence of the assent of the commission to those claims, and that the number of lines used in stating the issue was to indicate the weight attached by us to that particular consideration, we should have been more careful in the phrasing of our opinion. In the main, the transportation conditions for oranges and lemons from southern California to eastern markets are the same, and it is pointed out that for the better part of eight years the defendants had, of their own free will, maintained a rate on lemons at first 25 cents and later 15 cents lower than the rate on oranges. The fact that a much larger per cent. of oranges move under refrigeration than of lemons would justify a somewhat lower rate on lemons than on oranges. If the lemon rate is to be measured by the orange rate, then the commission thinks the orange rate should be reduced in determining a fair relationship, not that the lemon rate should be advanced. The commission is of the opinion that the rate of \$1.15 on lemons is unjust and unreasonable, and should not exceed \$1. This decision is not based on any consideration that the American producer should be protected against foreign competition. The commission points out that since lemons can move simply under ventilation, and that about 5,500 cars have collapsible bunkers, into which bunkers fruit moving under ventilation can be loaded, the car loading on lemons is potentially larger than on oranges, and railways should be allowed to require the shipper to load the collapsible bunker cars to their capacity.

One ground of attack of the former order of the commission was that it was without authority to establish a blanket rate extending from the Rocky mountains and covering the whole East. The question presented to the commission was not what would be a reasonable rate if the commission were for the first time establishing such rates, but, rather, is \$1.15 or \$1, or some other figure, reasonable as a blanket rate. The commission did not wish to fight this contention, and in the supplemental hearings the commission asked both the defendant and the complainant whether they wished a blanket rate established or graded rates, and both joined in asking a blanket rate. The question of damages is reserved for a further hearing.

Commissioner Lane concurring:

We are called on in this case to pass on the reasonableness of a rate on lemons that is the same from Los Angeles to Denver as from Los Angeles to Boston. Manifestly, if there is any direct relation between the cost of service and the rate charged, such method of making rates is in conflict with the law. These great blankets, however, are made as a matter of policy. They

are instituted by the carriers for their own benefit to develop the industry and to extend and simplify the marketing of fruit. This case, when broadly reported, involves a question of the highest national importance. The whole continent for a zone of 2,000 miles is made to serve the Pacific coast terminal cities at uniform rates, while the states between the mountains are not given such advantage. At the same time, the lumber of the far Northwest is not so treated, nor the wool or hides of the interior. Primarily it is a matter of national concern and not of railway policy as to what system of rate making shall obtain, so long as the carriers receive a reasonable return on the value of their property. The railway, by its rates, may make each portion of the country largely independent of the remainder, or it may make of the nation one economic and industrial unit, each portion thereof doing best, that which nature has fitted it to do best. This is fundamentally the difference in philosophy which underlies the two methods of making rates which have been given consideration in this case. There is no doubt in my mind but that the commission could not itself prescribe this blanket rate which the commission approves, because neither the carriers nor the shippers wish it destroyed. Commissioner Meyer concurs with Commissioner Lane.

Commissioner Clark concurring in part:

It seems to me clear that it would be greatly to the advantage of citrus fruit growers and shippers if the blanket rate were broken up. I am unable to discover any substantial transportation difference between the movement of oranges and of lemons except that the lemons stand transportation better than the oranges do. The enforcement of a minimum weight on cars carrying lemons under ventilation higher than that on lemons moving under refrigeration is agreed to. (22 I. C. C., 149.)

STATE COMMISSIONS.

The Massachusetts Commission has authorized the Boston Elevated Railway Company to act as a common carrier of baggage and freight in the city of Boston. The order contemplates the doing of an express business only.

The Railroad Commission of Louisiana, in answer to a complaint of the Shreveport Chamber of Commerce, has said that while it recognizes the necessity for the correction of erroneous demurrage assessments at this time, there has been no practical way suggested or any remedy shown to the commission that will improve present demurrage rules.

The Railroad Commission of Louisiana, in a case where complaint was made against the condition of the roadbed and track of the New Orleans Great Northern between St. Tammany station and Pearl river, employed an expert to make an examination, and from his report the commission comes to the conclusion that the roadbed and track complained of is in an unsafe condition. "While trains may be run over this road at a very slow speed with utmost caution without greatly endangering the lives of passengers, its condition is such that adequate and suitable freight and passenger service cannot be rendered to the public." The commission, therefore, orders the track to be put in such condition by April 1, 1912, as will render it safe for trains going 25 miles an hour.

COURT NEWS.

In a local court at Wabash, Ind., a trainmaster of the Cleveland, Cincinnati, Chicago & St. Louis has been fined \$5 for refusing to issue a "letter of service" to an employee who resigned. The last legislature of Indiana passed a law making the giving of such letters compulsory. The case will be appealed.

In the case of Oliver Huff, a brakeman of the New York, New Haven & Hartford, who sued the road for damages on account of injuries sustained in a collision, basing his suit on the federal laws as they now stand (with the fellow-servant provision abolished), and in which the plaintiff secured a verdict for \$22,500, the court has acted favorably on the motion of the defense, asking for a new trial; but mainly because the verdict is regarded as excessive. If Huff will accept \$10,000, the motion for a new trial will be denied.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF OCTOBER, 1911.

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RAILWAY AGE GAZETTE.

Name of road.	Operating revenues			Maintenance of way and structures, equipment.			Trans- portation.			Net operating revenue.			Outside operations.			Operating income (or loss).		
	Mileage operated at end of period.	Freight.	Pasenger.	Total, inc. misc.	Traffic.	Passenger.	General.	Total.	(or deficit).	\$245	\$38,345	\$5,189	\$33,401	\$3,224	\$3,224	\$3,224	\$3,224	\$3,224
Atlantic & West Point.	92	\$6,222	\$4,096	\$115,009	\$12,287	\$21,428	\$5,194	\$5,180	\$76,664	\$4,108	\$6,659	—2,551	93,442	15,831	15,831	15,831	15,831	15,831
Atlantic & St. Lawrence.	166	93,647	23,483	23,483	22,789	3,681	48,883	3,015	120,211	1,961	5,976	—4,956	7,000	—7,073	—7,073	—7,073	—7,073	—7,073
Atlantic City.	166	69,066	58,093	136,679	46,843	3,681	3,013	120,703	1,961	5,976	—4,956	5,500	102,436	11,332	11,332	11,332	11,332	11,332
Belt Ry. Co. of Chicago.	21	77,807	7,287	91,357	14,100	3,681	3,013	132,907	1,961	5,976	—4,956	2,000	9,909	—11,905	—11,905	—11,905	—11,905	—11,905
Butte, Anaconda & Pacific.	46	77,780	349,478	411,593	1,440,537	137,525	30,122	423,404	35,684	82,907	5,763	7,000	—4,283	—4,607	—4,607	—4,607	—4,607	—4,607
Canadian Pacific Lines in Maine.	233	61,821	17,184	84,000	26,345	13,884	5,149	5,180	82,907	5,763	82,907	5,763	7,000	—4,283	—4,607	—4,607	—4,607	—4,607
Central of Georgia Lines.	1,915	349,478	349,478	349,478	430,813	572,376	49,153	856,117	60,099	1,961	5,976	—4,956	4,108	4,108	4,108	4,108	4,108	4,108
Cheapeake & Ohio Lines.	2,355	311	484,633	2,909,738	430,813	572,376	21,004	358,151	1,961	5,976	—4,956	4,108	4,108	4,108	4,108	4,108	4,108	4,108
Chesapeake & Ohio & Dayton.	1,014	674,287	153,552	922,092	30,053	14,3788	6,072	166,307	4,621	10,116	64,858	—1,438	9,407	55,451	55,451	55,451	55,451	55,451
Cincinnati, Hamilton & Dayton.	190	129,635	129,635	129,635	309,163	209,163	27,182	6,072	10,116	64,858	—1,438	31,615	230,929	12,241	12,241	12,241	12,241	12,241
Detroit, Grand Haven & Milwaukee.	1,197	77,780	7,287	91,357	14,760	18,1091	20,491	37,964	7,044	27,618	10,116	64,858	—1,438	31,615	230,929	12,241	12,241	12,241
Georgia Southern & Florida.	347	2,355	2,355	2,355	1,157,665	4,601,215	817,206	936,058	11,760	603	1,961	5,976	—4,956	4,108	4,108	4,108	4,108	4,108
Grand Trunk Western.	4,755	869,631	32,287	1,137,954	1,137,954	93,373	115,443	16,756	31,873	1,961	5,976	—4,956	4,108	4,108	4,108	4,108	4,108	4,108
Illinois Central & Great Northern.	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159
Kansas City, Mexico & Orient.	809	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159
Louisiana Ry. & Navigation.	350	155,943	23,658	194,595	19,573	37,964	5,149	10,658	1,961	5,976	—4,956	4,108	4,108	4,108	4,108	4,108	4,108	4,108
Missouri, Kansas & Texas.	3,915	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159	1,159
Missouri Pacific.	1,165	1,165	1,165	1,165	1,165	1,165	1,165	1,165	1,165	1,165	1,165	1,165	1,165	1,165	1,165	1,165	1,165	1,165
New Orleans, Texas & Mexico.	264	107,790	18,132	125,922	13,719	218,091	20,491	37,964	7,044	27,618	10,116	64,858	—1,438	31,615	230,929	12,241	12,241	12,241
Philadelphia & Reading.	1,014	3,255,976	3,255,976	3,255,976	10,047	4,04,274	32,287	49,857	42,608	11,226	6,072	10,658	1,961	5,976	—4,956	4,108	4,108	4,108
Port Reading.	1,027	283,222	10,047	37,964	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047
St. Louis, Iron Mountain & Southern.	3,314	2,124,131	2,124,131	2,124,131	2,124,131	2,124,131	2,124,131	2,124,131	2,124,131	2,124,131	2,124,131	2,124,131	2,124,131	2,124,131	2,124,131	2,124,131	2,124,131	2,124,131
St. Louis, Southwestern.	796	568,738	17,385	72,191	10,186	203,769	20,491	37,964	7,044	27,618	10,116	64,858	—1,438	31,615	230,929	12,241	12,241	12,241
San Antonio & Aransas Pass.	727	320,080	10,428	459,828	72,373	39,969	5,149	10,658	1,961	5,976	—4,956	4,108	4,108	4,108	4,108	4,108	4,108	4,108
Seaboard Air Line.	3,053	1,407,576	411,302	2,042,274	275,068	278,855	16,280	172,246	17,343	10,658	—4,956	4,108	4,108	4,108	4,108	4,108	4,108	4,108
Southern Pacific Co.	6,184	5,258,765	2,656,630	8,342,152	73,157	78,798	14,133	10,658	1,961	5,976	—4,956	4,108	4,108	4,108	4,108	4,108	4,108	4,108
Spokane, Portland & Seattle.	550	301,194	147,748	411,590	41,626	41,626	4,108	2,336	4,108	10,658	1,961	5,976	—4,956	4,108	4,108	4,108	4,108	4,108
Toledo, Peoria & Western.	247	61,710	2,837	72,019	10,186	458,893	4,108	37,964	7,044	27,618	10,116	64,858	—1,438	31,615	230,929	12,241	12,241	12,241
Ulster & Delaware.	2514	1,830,592	662,170	2,691,293	72,373	39,969	5,149	10,658	1,961	5,976	—4,956	4,108	4,108	4,108	4,108	4,108	4,108	4,108
Wabash & Western.	166	282,167	86,754	127,951	80,271	83,162	8,534	172,246	17,343	10,658	—4,956	4,108	4,108	4,108	4,108	4,108	4,108	4,108
Western Maryland.	543	1,519,146	341,302	2,042,274	275,068	278,855	16,280	172,246	17,343	10,658	—4,956	4,108	4,108	4,108	4,108	4,108	4,108	4,108
Western Pacific.	934	414,888	101,962	530,134	117,271	49,798	5,149	10,658	1,961	5,976	—4,956	4,108	4,108	4,108	4,108	4,108	4,108	4,108
Western Ry. of Alabama.	133	81,449	45,371	122,271	138,015	16,171	20,929	5,149	10,658	1,961	5,976	—4,956	4,108	4,108	4,108	4,108	4,108	4,108
Yazoo & Mississippi Valley.	1,371	499,537	222,729	784,921	164,444	14,866	15,497	26,087	47,468	84,836	68,402	1,961	5,976	—4,956	4,108	4,108	4,108	4,108
FOUR MONTHS OF FISCAL YEAR 1912.																		
Atlanta & West Point.	92	\$223,775	\$170,028	\$430,586	\$50,236	\$79,023	\$20,001	\$121,934	\$20,489	\$291,903	\$138,903	\$680	\$20,489	\$118,827	\$20,370	\$20,370	\$20,370	\$20,370
Athletic City.	166	282,167	692,078	1,022,317	2,131,555	1,596,817	93,962	13,955	5,149	10,658	1,961	5,976	—4,956	4,108	4,108	4,108	4,108	4,108
Atlantic & St. Lawrence.	21	286,872	127,951	460,817	90,175	16,280	8,534	16,280	18,280	18,280	18,280	18,280	18,280	18,280	18,280	18,280	18,280	18,280
Belt Ry. Co. of Chicago.	46	298,252	46,520	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047
Belle, Anaconda & Pacific.	46	298,252	46,520	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047	10,047
Cent. of Georgia.	233	1,186,550	277,416	287,400	50,236	50,236	10,047	5,149	5,149	5,149	5,149	5,149	5,149	5,149	5,149	5,149	5,149	5,149
Canadian Pacific Lines in Maine.	1,915	2,960,055	1,380,803	4,750,800	2,131,555	1,596,817	93,962	13,955	5,149	5,149	5,149	5,149	5,149	5,149	5,149	5,149	5,149	5,149
Central of Georgia Lines.	2,241	9,000,740	2,131,555	1,380,803	2,131,555	1,596,817	93,962	13,955	5,149	5,149	5,149	5,149	5,149	5,149	5,149	5,149	5,149	5,149
Cincinnati, Hamilton & Dayton.	1,014 ^a	2,642,617	676,650	3,461,337	1,73,737	1,381,364	4,23,315	2,131,555	1,596,817	1,596,817	1,596,817	1,596,817	1,596,817	1,596,817	1,596,817	1,596,817	1,596,817	1,596,817
Detroit, Grand Haven & Milwaukee.	190	461,723	270,357	102,121	102,121	102,121	102,121	102,121	102,121	102,121	102,121	102,121	102,121	102,121	102,121	102,121	102,121	102,121
Georgia Southern & Florida.	395	506,998	97,793	623,705	80,551	83,140	10,047	26,707	26,707	26,707								

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

James E. Baldwin has been appointed assistant auditor of the New York, Chicago & St. Louis, with office at Cleveland, Ohio.

W. S. McCaull, claims attorney of the Quincy, Omaha & Kansas City, with office at Kansas City, Mo., has resigned to engage in the private practice of law.

Byron Clark, attorney for the Chicago, Burlington & Quincy at Lincoln, Neb., has been appointed general solicitor of the lines west of the Missouri river, with office at Omaha, Neb., succeeding James E. Kelby, resigned to engage in private practice.

T. E. Clarke, general superintendent of the Delaware, Lackawanna & Western, at Scranton, Pa., has been appointed assistant to the president, with office at Scranton, and with such duties to perform as shall be assigned to him from time to time by the president.

A. E. Miller, assistant to the general attorney of the Duluth, South Shore & Atlantic and the Mineral Range Railroad at Marquette, Mich., has been appointed general attorney, with office at Marquette, succeeding A. B. Eldredge, elected president and general counsel.

L. Emery Katzenbach, whose appointment as secretary and assistant treasurer of the Great Northern, with office at St. Paul, Minn., has been announced in these columns, was born February 23, 1880, at New York City and graduated from Princeton University in the class of 1901. He began railway work on June 15, 1901, in the accounting department of the New York Central & Hudson River and remained with that company and New York Central Lines until April, 1906, when he entered the service of the Colorado & Southern in the office of the secretary and treasurer at New York, and was appointed assistant treasurer in 1907. He remained in the service of that company until it came under the control of the Chicago, Burlington & Quincy, in June, 1909, when he was elected assistant secretary and assistant treasurer of the Colorado & Southern and affiliated companies in charge of the New York office. He has held these positions since that time, and in addition was elected assistant secretary of the Chicago, Burlington & Quincy on November 17, 1910.

Operating Officers.

H. W. Joslyn has been appointed assistant superintendent on the Idaho division of the Oregon Short Line, with headquarters at Glens Ferry, Idaho.

W. J. Houlihan has been appointed trainmaster of the Great Northern, with office at Great Falls, Mont., succeeding C. C. Reynolds, assigned to other duties.

G. W. Clark, assistant superintendent of the Central New England at Hartford, Conn., has been appointed superintendent, succeeding to the duties of O. M. Laing, general superintendent, deceased.

R. W. Edwards, superintendent of the Kansas City terminals of the Kansas City Southern, has been appointed superintendent of all terminals of the Pittsburgh & Lake Erie, with headquarters at Youngstown, Ohio.

C. O. Dambach, trainmaster and superintendent of telegraph of the Wabash Pittsburgh Terminal and the West Side Belt at Pittsburgh, Pa., has been appointed superintendent of these companies, and the office of trainmaster has been abolished.

J. W. Higgins, assistant general manager of the Missouri Pacific, and the St. Louis, Iron Mountain & Southern, at St. Louis, Mo., who has been acting general manager since September, has been appointed general manager, succeeding A. W. Sullivan, resigned.

M. J. Sullivan, formerly superintendent of the Northern division of the Kansas City Southern at Pittsburg, Kan., has been appointed superintendent of terminals, with office at Kansas City,

Mo., succeeding R. W. Edwards, resigned to accept service with another company.

F. G. Archer has been appointed general yardmaster of the Baltimore & New York and the Staten Island Rapid Transit, with jurisdiction over all yard work at Cranford Junction, Arlington and St. George, including docking of floats at St. George, Staten Island, N. Y.

E. M. Rine, assistant general superintendent of the Delaware, Lackawanna & Western, at Scranton, Pa., has been appointed general superintendent, in charge of the transportation department and his former position has been abolished, succeeding T. E. Clarke, promoted. See Executive, Financial and Legal Officers.

W. B. Wood, formerly superintendent of the Akron division at Akron, Ohio, of the Pennsylvania Lines West, has been appointed superintendent of the Cleveland and Pittsburgh division, succeeding T. B. Hamilton, promoted. Nettleton Neff, superintendent of the Richmond division, at Richmond, Ind., succeeds Mr. Wood. J. C. McCullough, superintendent of the Marietta division, at Cambridge, Ohio, has been appointed superintendent of the Richmond division, and H. K. Brady, trainmaster of the eastern division, has been promoted to superintendent of the Marietta division.

W. S. Kirby, superintendent of the Chicago, Burlington & Quincy at Aurora, Ill., has been appointed special inspector on the staff of the general manager, with office at Chicago. Robert Rice, superintendent at St. Joseph, Mo., succeeds Mr. Kirby, and B. B. Greer, superintendent of the Hannibal division at Hannibal, Mo., succeeds Mr. Rice. W. C. Welch, superintendent at Brookfield, Mo., succeeds Mr. Greer. W. A. Chittenden, assistant superintendent at Aurora, Ill., succeeds Mr. Welch. F. Cone, assistant superintendent at Ottumwa, Iowa, succeeds Mr. Chittenden. N. C. Allen, trainmaster of the Ottumwa division at Burlington, Iowa, has been transferred to Ottumwa, and T. C. Dougherty succeeds Mr. Allen.

Thomas B. Hamilton, who has been appointed general superintendent of the Central system of the Pennsylvania Lines West of Pittsburgh, with office at Toledo, Ohio, as has been announced in these columns, was born August 7, 1865, at Columbus, Ohio. He graduated from Princeton University in 1888, and began railway work in November of the same year as rodman on the Jefferson, Madison & Indianapolis, now part of the Pittsburgh, Cincinnati, Chicago & St. Louis. On January 27, 1890, he became connected with the engineering corps of the Pittsburgh division of the latter road, and six years later was made assistant engineer on the same division. He was engineer of maintenance of way from May, 1897, to June,



T. B. Hamilton.

1901, having been consecutively on the Toledo division of the Pennsylvania Company, on the Cincinnati district of the P. C. C. & St. L. and on the Cleveland & Pittsburgh division of the Pennsylvania Company. He was then appointed superintendent of the Erie & Ashtabula division, and on December 21, 1903, was made superintendent of the Cleveland & Pittsburgh division, which position he was holding at the time of his recent promotion to general superintendent.

J. W. Small, whose appointment as superintendent of motive power of the Southern Pacific line in Texas, with office at Houston, Tex., has been announced in these columns, has been given the title of assistant general manager of the Galveston, Harrisburg & San Antonio, the Houston & Texas Central, the

Houston, East & West Texas, the Houston & Shreveport and the Texas & New Orleans, and the title of superintendent of motive power will be retained by him to such extent only as may be necessary for compliance with laws and existing contracts. (See item under Engineering and Rolling Stock Officers.) George McCormick has been appointed assistant superintendent of the Galveston, Harrisburg & San Antonio, with office at El Paso, Tex., succeeding D. W. Fitzgerald, granted leave of absence on account of illness.

Traffic Officers.

O. H. Taylor has been appointed passenger traffic manager of the Eastern Steamship Corporation, with office at New York City.

W. C. Saunders has been appointed assistant general passenger agent of the Norfolk & Western, with headquarters at Roanoke, Va.

Albert Thompson, manager of the advertising bureau of the Chicago & Alton, with office at Chicago, has resigned to engage in other business.

F. A. Brown has been appointed traveling passenger agent of the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at Kansas City, Mo.

James S. Patterson, chief clerk to the general freight agent of the Chesapeake & Ohio, has been appointed also commerce agent with office at Richmond, Va.

H. M. Runyon has been appointed general eastern freight agent of the Seaboard Air Line, with office at New York City, succeeding C. L. Smith, resigned.

C. F. Schmidt, chief clerk to the general freight and passenger agent of the Louisiana & Arkansas, at Texarkana, Ark., has been appointed general agent, with office at Texarkana.

W. R. Sheldon, general agent of the Minneapolis, St. Paul & Sault Ste. Marie at Helena, Mont., has been appointed division freight and passenger agent, with office at Calgary, Alberta, Canada.

W. W. Trimble, traveling freight agent of the Missouri Pacific, at Memphis, Tenn., has been appointed a contracting freight agent. W. D. Arens, chief clerk, succeeds Mr. Trimble, and E. P. Costello succeeds Mr. Arens.

William D. Corfield has been appointed division freight agent of the Philadelphia & Reading, the Perkiomen Railroad and the Stony Creek Railroad, with office at Philadelphia, Pa., succeeding J. J. Bergen, deceased.

George R. Chesbrough has been appointed eastern passenger agent of the Missouri, Kansas & Texas, with office in New York. Herbert Comins, traveling freight agent in New York, has been appointed traveling passenger agent at the same place.

J. E. Williams, assistant general freight agent of the Pere Marquette at Detroit, Mich., has been appointed a member of the Committee on Uniform Classification, succeeding Robert N. Collyer, resigned to become chairman of the Official Classification Committee.

O. F. Scudder has been appointed assistant real estate and industrial commissioner of the Chicago, Burlington & Quincy for the lines east of the Missouri river, with office at Chicago. R. W. Foster, assistant general agent at Portland, Ore., has been appointed commercial agent, with office at Portland.

E. M. Elliott has been appointed agent of the Star Union Line of the Pennsylvania Lines West and the Pennsylvania Railroad, with headquarters at Indianapolis, Ind., succeeding H. H. Gray, promoted. Wallace M. Crozier has been appointed freight solicitor in connection with the office of the export agent at Chicago.

E. H. Bryant, traveling freight agent of the Baltimore & Ohio at Kansas City, Mo., has been transferred to Minneapolis, Minn. C. K. Minor, soliciting freight agent at Kansas City, succeeds Mr. Bryant, and W. S. Fuhrman succeeds Mr. Minor. N. D. Harding has been appointed commercial agent at Davenport, Iowa.

George L. Alley, general baggage agent of the Oregon Short Line at Salt Lake City, Utah, has been appointed general bag-

gage agent of the Union Pacific, with office at Omaha, Neb., succeeding Andrew Traynor, retired under the pension rules of the company on January 1, after a service of more than 43 years with the road.

The following officers of the Chicago, Milwaukee & Puget Sound, the Tacoma Eastern and the Gallatin Valley have had their jurisdiction extended over the Big Blackfoot Railway: R. M. Calkins, traffic manager; F. D. Burroughs, general freight agent; G. W. Hibbard, general passenger agent, and J. M. Allen, freight claim agent, all at Seattle, Wash.; W. D. Carrick, general baggage agent at Milwaukee, Wis., and A. J. Hillman, division freight and passenger agent at Butte, Mont.

J. M. Harris, traveling passenger agent of the Pennsylvania Lines at Atlanta, Ga., has been appointed district passenger agent of the lines west of Pittsburgh, with office at Toledo, Ohio, succeeding G. L. A. Thomson, transferred to Chicago. P. J. Wickham, traveling passenger agent at Spokane, Wash., has been appointed traveling passenger agent, with headquarters at Seattle, Wash., succeeding C. L. Harbaugh, transferred, and W. F. Chase, passenger agent at Milwaukee, Wis., succeeds Mr. Wickham. J. M. Neafus succeeds Mr. Chase.

Incidental to the merger of the Minneapolis & St. Louis and the Iowa Central, a number of changes in the personnel of the traffic department have been made, effective January 1: W. L. Ross, vice-president in charge of traffic; R. J. McKay, general passenger agent; B. C. Stevenson, assistant freight traffic manager; J. W. Graham, assistant general freight agent in charge of tariffs, and H. G. Thompson, commercial agent, all at Chicago; E. C. Coffey, assistant general freight agent at Peoria, Ill.; A. K. Handy, general Eastern freight agent at New York; R. M. Baumgardner, New England freight agent at Boston, Mass.; and C. F. Vigor, general agent in the freight department at Buffalo; all of whom have been in charge of the Chicago & Alton, the Toledo, St. Louis & Western, the Minneapolis & St. Louis and the Iowa Central, have had their jurisdiction withdrawn from the two latter roads. S. G. Lutz, traffic manager, and A. B. Cutts, assistant traffic manager, both at Minneapolis, Minn., have had their jurisdiction extended to include matters formerly in charge of the vice-president in charge of traffic, the general passenger agent and the assistant freight manager at Chicago. H. T. Boyd, commercial agent of the Minneapolis & St. Louis at Des Moines, Iowa, has been appointed general agent in the freight department at Peoria, and J. T. Redmond, contracting freight agent at Peoria, has been appointed commercial agent at that place. C. A. Werlich has been appointed chief of the tariff bureau, with office at Minneapolis, succeeding to the duties of Mr. Graham, and E. H. Spence has been appointed general Eastern agent, with office at New York, succeeding Mr. Handy. E. L. Dalton has been appointed commercial agent at Chicago, and J. R. Shannon has been appointed traveling freight agent at the same place. W. M. Hardin, commercial agent at Kansas City, Mo., has been appointed commercial agent at Minneapolis, succeeding H. C. Yutzy, and J. A. Lucey, traveling freight agent at Minneapolis, succeeds Mr. Hardin. H. C. Yutzy succeeds Mr. Lucey. J. B. Helwig has been appointed a contracting freight agent, with headquarters at Cincinnati, Ohio, and L. C. Rains has been appointed grain and flour agent, with office at Minneapolis. G. C. Houk, traveling freight agent at Fort Dodge, Iowa, has been appointed commercial agent, with office at Des Moines, succeeding H. T. Boyd, promoted, and E. C. Davis succeeds Mr. Houk.

Engineering and Rolling Stock Officers.

H. R. Gibson has been appointed division engineer maintenance of way of the Baltimore & Ohio, with office at Flora, Ill., succeeding T. H. Brown, resigned.

Bayard Wright has been appointed engineer maintenance of way of the Newburgh & South Shore, with office at Newburgh, Ohio, succeeding A. H. Stewart, resigned.

Frank A. Howard, assistant engineer of bridges and buildings of the Erie Railroad at New York, has been appointed engineer of bridges and buildings, with office at New York.

R. J. Turnbull, assistant superintendent of machinery of the Missouri Pacific at St. Louis, Mo., has been appointed acting

superintendent of machinery, with office at St. Louis, succeeding J. W. Small, resigned to accept service with another company.

C. E. Knickerbocker having resigned as chief engineer of the New York, Ontario & Western, as has already been announced in these columns, J. H. Nuelle, principal assistant engineer at Middletown, N. Y., has been appointed engineer of maintenance of way.

F. K. Murphy, supervisor of air brakes of the Cleveland, Cincinnati, Chicago & St. Louis, has been appointed master mechanic, with office at Brightwood, Ind., succeeding F. M. Lawler, retired on a pension, after a service of 41 years with the road. J. A. Gibson, master mechanic of the Peoria & Eastern division at Urbana, Ill., has resigned.

George Woods, roadmaster of the Chicago, Rock Island & Pacific at El Dorado, Ark., has been appointed roadmaster at El Reno, Okla. H. Berend, roadmaster at Sibley, Iowa, has been transferred to the Missouri division, with office at Washington, Iowa, and F. E. Allen, general foreman of shops at Valley Junction, Iowa, succeeds Mr. Berend.

J. W. Small, whose appointment as superintendent of motive power of the Southern Pacific Lines in Texas, with office at Houston, Tex., has been announced in these columns, has been appointed also superintendent of motive power of the Louisiana Western, and of Morgan's Louisiana & Texas Railroad & Steamship Company. (See item under Operating Officers.)

G. T. Hartman, assistant superintendent of the Copper Range, at Houghton, Mich., will have jurisdiction over the mechanical and supply departments, and the present heads of these departments will report to him. Mr. Hartman is to continue to report to the general superintendent, and will devote his entire time to the above departments, relinquishing his present duties in train and station matters, etc.

P. F. Smith, Jr., master mechanic of the Pennsylvania Lines West at Columbus, Ohio, has been appointed superintendent of motive power of the new grand division to be known as the Central system. This is composed of the Cleveland, Akron & Columbus Railway, with its two divisions, the Akron and the Zanesville, heretofore operated by its own separate organization; and the Toledo, Columbus & Ohio River with its two divisions, the Toledo and the Marietta, formerly in the Northwest system. G. B. Fravel, master mechanic at Dennison, Ohio, succeeds Mr. Smith, and J. J. Walsh, master mechanic of the Logansport (Ind.) shops, succeeds Mr. Fravel. H. H. Hilberry, master mechanic at Toledo, Ohio, has been transferred to Mahoningtown, Pa.; and J. W. Hopkins, general foreman at Richmond, Ind., has been appointed master mechanic at Toledo, Ohio.

Purchasing Officers.

C. H. Kenzel, assistant purchasing agent of the Elgin, Joliet & Eastern at Chicago, has been promoted to purchasing agent, and his former position has been abolished.

W. C. Blake has been appointed division storekeeper of the J. & O. district of the Mobile & Ohio, with office at Jackson, Tenn., succeeding E. T. Bracken, transferred.

John H. Guess, assistant general purchasing agent of the Grand Trunk at Montreal, Que., has been appointed general purchasing agent, succeeding A. Butze, retired under the provisions of the pension fund, and R. Johnson succeeds Mr. Guess, both with offices at Montreal.

OBITUARY.

L. L. Korn, traveling freight agent of the Atchison, Topeka & Santa Fe, with headquarters at Cincinnati, Ohio, died at that place on December 28.

Alonzo C. Goodrich, formerly manager of the Centerville division of the Chicago, Burlington & Quincy, with office at Keokuk, Iowa, died at his home in Chicago on January 1. Mr. Goodrich was born September 30, 1852, at Pittsfield, Rutland county, Vermont, and began railway work in April, 1872, as a rodman on the engineering corps of the Chicago & North Western. From December, 1886, to July, 1904, he was general manager of the Keokuk & Western and manager of the Centerville division of the Burlington, which absorbed the Keokuk & Western.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

THE CHICAGO, ROCK ISLAND & PACIFIC is figuring on 45 Mikado locomotives.

THE NEW YORK, NEW HAVEN & HARTFORD has ordered three electric locomotives from the Westinghouse Electric & Manufacturing Company.

THE SYDNEY & LOUISBURG has ordered 1 consolidation locomotive from the Montreal Locomotive Works. The dimensions of the cylinders will be 21 in. x 26 in., the diameter of the driving wheels will be 50 in., and the total weight in working order will be 177,000 lbs.

THE PAULISTA RAILWAY, Brazil, has ordered 4 ten-wheel locomotives from the American Locomotive Company. The dimensions of the cylinders will be 17 in. x 20 in., the diameter of the driving wheels will be 48 in., and the total weight in working order will be 96,000 lbs.

CAR BUILDING.

THE LEHIGH VALLEY is figuring on 2 dining cars.

THE DELAWARE, LACKAWANNA & WESTERN has ordered 200 refrigerator cars from the Standard Steel Car Company.

IRON AND STEEL.

THE CANADIAN PACIFIC has ordered 42,000 tons of rails from the Inland Steel Company.

THE MINNESOTA, DAKOTA & WESTERN has ordered 2,000 tons of rails from the Illinois Steel Company.

THE NATIONAL RAILWAYS OF MEXICO have ordered 4,500 tons of rails from the Maryland Steel Company.

THE BUFFALO, ROCHESTER & PITTSBURGH has ordered 1,300 tons of bridge material from the American.

THE SOUTHERN RAILWAY has ordered 21,000 tons of rails from the Tennessee Coal, Iron & Railroad Company.

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE has ordered 18,000 tons of rails from the Illinois Steel Company.

THE TRANSCONTINENTAL will receive tenders until January 10 for 14,468 tons of 80-lb. rails, and the necessary rail fastenings.

THE BALTIMORE & OHIO has ordered 500 tons of bridge steel from the McClintic-Marshall Construction Company for use in Chicago.

GENERAL CONDITIONS IN STEEL.—The holiday period has been a busy one for the steel mills. Increasing rush orders have forced the manufacturers to keep their mills operating at about 80 per cent. of their capacity even on January 1. This period is usually devoted to overhauling the plants, but that was not the case this year. The rolling mills have enough orders on their books to insure capacity operations for about four months, and a large volume of orders is still pending. The forces will be increased immediately, and it is expected that operations will average between 80 and 85 per cent. of capacity for the month. No immediate increase in prices is anticipated.

FOREIGN RAILWAY NOTES.

Capital has been subscribed for carrying out the construction of the Trans-Uruguayan Railway from Coronilla to Santa Rosa, with branches in Brazil and Argentina.

The Usambara Railway Company's line near the northern border of German East Africa, whose ocean terminus is Tanga, about 100 miles south of the Uganda Railway terminus, and 125 miles north of Dar-es-Salaam, has lately been extended to Moschi, just south of the famous mountain Kilimanjaro.

Supply Trade News.

Dwight P. Robinson and John W. Hallowell have been made members of the firm of Stone & Webster, Boston, Mass.

The Standard Steel Works Company, Philadelphia, Pa., has opened a branch office in the First National Bank building, Denver, Col.

The Railway & Mill Equipment Company, New Orleans, La., has been established to sell railway supplies. Seely Dunn and J. Otho Elmer are officers.

F. H. Jones, assistant resident manager of the General Railway Signal Company, Rochester, N. Y., with office at Chicago, has been made resident manager at San Francisco, Cal., C. O. Poor, general superintendent of the Rochester works of the company, succeeds Mr. Jones at Chicago.

The Simplex Railway Appliance Company, Hammond, Ind., has been incorporated in Delaware with \$1,000,000 capital stock, to make interurban, street and steam railway cars, trucks, wheels, etc. Harry H. Philips is president, and Paul A. Neuffer, secretary.

The United Car Company, with offices in the Commercial National Bank building, Chicago, which has recently been organized with C. H. Thomas, F. A. Hecht and E. R. Davis as directors, has purchased the entire plant and equipment of the American Car & Equipment Company, Chicago Heights, Ill., including a large erecting shop, blacksmith shop, offices, etc. It will build and rebuild cars and handle railway supplies in general, making a specialty of steel underframes and tank cars. Mr. Thomas is president of the company; Mr. Hecht, vice-president; and N. B. Hall, secretary.

F. C. Lavarack, signal engineer at New York for the Federal Signal Company, Albany, N. Y., has resigned to become general sales manager of the Signal Accessories Company, with offices recently established at 140 Nassau street, New York. The Signal Accessories Company has been incorporated to manufacture signal materials, and in addition to handle the sales of the United Electric Apparatus Company, Boston, Mass.; the W. F. Bossert Manufacturing Company, Utica, N. Y.; the American Conduit Company, East Chicago, Ind.; and various other companies. Mr. Lavarack has spent his entire business life in the railway signal field, having been with the Standard Signal Company; the Pneumatic Signal Company; the New York Central & Hudson River; the School of Railway Signaling; and later with the Federal Signal Company.

On December 28, 1911, Judge Christian C. Kohlsaat, of the United States Circuit Court, decided the case of the Railroad Supply Company, Chicago, against the Hart Steel Company, Elyria, Ohio, and Guilford S. Wood, Chicago, pending in the United States Circuit Court for the northern district of Illinois, and dismissed the bill for want of equity, holding that, while the three Wolhaupler patents, upon which the suit was instituted, were valid under the state of the art shown by the record, the claims must be limited to the devices described in the specifications, and that when so construed the device sold by the defendants did not infringe. An appeal was at once prayed and allowed to the United States Circuit Court of Appeals for the seventh circuit, and will be heard at the April session of that court in Chicago. The companion suit against the Elyria Iron & Steel Company, Elyria, will be heard before Judge Day in the federal court at Cleveland in January, 1912.

TRADE PUBLICATIONS.

REFRIGERATION AND VENTILATION.—Burton W. Mudge & Company, Chicago, have published an illustrated booklet on the Garland system of ventilation, heating and refrigeration applied to refrigerator cars.

CHAINS.—The Morse Chain Company, Ithaca, N. Y., has published bulletin No. 11 on the Morse Silent chain. This chain is described in detail and illustrated by photographs and diagrams. An interesting comparison between rope drive and chain drive is included. On the last page of the bulletin data is given to be used in the design of the Morse Silent chain drive.

Railway Construction.

New Incorporations, Surveys, Etc.

CAMINO, PLACERVILLE & LAKE TAHOE.—Incorporated in California with \$100,000 capital, and headquarters at San Francisco. The plans call for building from Camino, Cal., to Placerville, 6 miles, and later to Lake Tahoe, about 50 miles. The incorporators include B. C. Dabaher, C. F. Wood and B. Sair, all of San Francisco.

CANADIAN NORTHERN.—The improvements to be carried out at Montreal, according to local reports include a tunnel to be about three miles long, under the mountain, to the heart of the city of Montreal. A large station is to be built at the end of the tunnel on the corner of St. Monique and Dorchester streets to Lagauchetiere street. There is also to be a large hotel built, and all the lines are to be electrified from Back river to the city. An overhead line is to be constructed from Lagauchetiere street station to the river front, connecting with the harbor commissioner's line, and a spur is to be built from Moreau street station to the harbor lines in the east, providing a continuous line from the tunnel's mouth to Moreau street. New freight sheds are to be put up near the corner of William and Nazareth streets. It is understood that the tunnel will be ready for operation in about two years, and that the entire cost of the improvements will be \$25,000,000. The work is to be started early in the spring. T. Turnbull, assistant chief engineer, Winnipeg, Man.

CENTRAL PACIFIC.—See Southern Pacific.

CLARKSBURG NORTHERN.—This company is said to be at work on a line from New Martinsville, W. Va., south to Middlebourne. The line is eventually to be extended either to Salem or Clarksburg, or to both of these places. T. M. Jackson, president, Clarksburg.

DELAWARE & HUDSON.—The general revision of grades between Nineveh, N. Y., and Oneonta, 37 miles, has been completed. The work included raising or lowering 10 miles of track and cost \$250,000.

DULUTH & NORTHERN MINNESOTA.—An officer writes that this company has projected an extension from mile post 68, through Minnesota to the Minnesota Canadian boundary. John Millen, president and general manager, Duluth, Minn.

ILLINOIS CENTRAL.—Two additional tracks have been laid by the Illinois Central between Homewood, Ill., and Matteson, five miles. The extension of suburban service to Matteson will be undertaken next spring. Double track improvements have been completed from Hawthorne, Ill., to Parkway on the Freeport division, and the New Orleans double tracking when finished will cover 50 miles.

KANSAS CITY, MEXICO & ORIENT.—An officer is quoted as saying that work will be finished on the branch from San Angelo, Tex., to Del Rio within the next twelve months, and it is understood that the money recently secured is to be used to pay for this work and to build from Wichita, Kan., either to Emporia, or to Osage City. W. W. Colpitts, chief engineer, Kansas City, Mo.

KIRKLAND-REDMOND RAILWAY, LIGHT & POWER COMPANY.—Incorporated in the state of Washington, with \$200,000 capital and headquarters at Seattle. The plans call for building an electric line from Kirkland, Wash., to Redmond, about 6 miles, and to other points in King county. E. A. Eaton, B. F. Gordon and W. D. Gillis are incorporators.

MEXICAN ROADS.—The government department of communications has received bids for building a line, it is said, from Balsas, the present terminus of the Cuernavaca division of the National Railways of Mexico, to the port of Zehuatanejo on the Pacific coast in the state of Guerrero. A branch line will also be constructed to Uruapan in the state of Michoacan, where it will make another connection with the National Railways of Mexico. The lines will be constructed by the government, and on completion will be taken over and operated as part of the National Railways of Mexico. The proposed work involves the construction of about 350 miles of track. The bids have not been made public.

The Mexican government has granted to a syndicate of Seattle, Wash., a concession to build 300 miles of railway which will connect Acapulco with the City of Mexico. The syndicate has under construction 120 miles, and the line to the capital will be an extension of the road now being built. Moritz Thompson is back of the project. The grant calls for completion of the work in six years.

MISSOURI, ARKANSAS & GULF.—This company was incorporated in April, 1911, with \$2,000,000 capital, to build from Rollo, Mo., south to Bakersfield, 125 miles; grading is said to be under way from Rollo to Willow Springs; surveys have not been made south of Willow Springs. G. Lay, president, St. Clair; W. E. Finke, secretary. W. B. Payne, engineer, Rolla. (August 18, p. 356.)

NATIONAL RAILWAYS OF MEXICO.—See Mexican Roads.

NEW YORK, WESTCHESTER & BOSTON.—An officer writes that work is now under way on 1.3 miles, between New York City and Mount Vernon, on 1.6 miles, between Mount Vernon and New Rochelle, and on 3.4 miles, between Mount Vernon and White Plains. The contractors are the O'Brien Construction Company and Henry Steers, Inc., both of New York City; Lathrop & Shea, Mount Vernon, and Merritt & Gilbert, New Rochelle. The projected work includes 9.7 miles between New Rochelle and Port Chester, and 6.4 miles from New York to Throgg's Neck. The company during the past year completed 12 miles of the four-track line between New York City and Mount Vernon, and between that place and New Rochelle and White Plains. J. L. Crider, chief engineer, New York. (June 23, page 1674.)

OREGON EASTERN.—See Southern Pacific.

PANHANDLE PECS & GULF OF TEXAS.—M. J. Healey, president of this company, is said to have entered into a contract with residents of Pecos, Texas, to build from Pecos, via Knowles, N. Mex., to Dawson Fields, Colo., about 350 miles. The first section to Knowles is to be finished in about eighteen months. The plans call for putting up shops, roundhouses, and a general office building in Pecos. Financial arrangements are said to have been made, and it is understood that grading work will be started soon.

SAN ANTONIO, ROCKPORT & MEXICAN.—According to press reports, this company will build from San Antonio, Tex., south via Crowther, to a point on the Rio Grande near Mission, with a branch from Crowther southeast to Rockport and Harbor Island, about 370 miles, at the latter place large docks are to be built. It is understood that the plans call for building an extension from San Antonio west to San Angelo, and lines in Mexico. Financial arrangements are said to have been made, and it is expected that the work will be started soon. R. Russell, president; A. L. Matlock, vice-president; J. H. Haile, treasurer, and V. L. Knight, secretary, with headquarters at San Antonio.

SAN JOSE & ALMADEN (Electric).—This company, which was recently incorporated, has started work on a line from San Jose, Cal., to Hacienda, about 11 miles. C. A. Nones, president.

ST. LOUIS, ARKANSAS & PACIFIC.—This is the new name of the Harrison mineral Belt which has increased its capital from \$80,000 to \$2,080,000. The main line is to be built from Harrison, Ark., southwest to Fallsville in Newton County, with a branch from Jasper northeast to Pontiac, Mo., in all about 100 miles. J. H. Kuder, secretary, Harrison.

ST. LOUIS, BROWNSVILLE & MEXICO.—An officer writes that contracts have been let and work is now under way on a branch from Bloomington, Tex., to Victoria, 14 miles. All material has been bought, and it is expected that the line will be in operation about March 1. F. G. Jonah, chief engineer, St. Louis, Mo.

SAVANNAH SOUTHERN.—An officer writes that this company is making surveys for an extension from Spurs, Ga., to Clyde, 6 miles. G. T. Tuten, secretary and treasurer, Letford, Ga.

SOUTHERN PACIFIC.—The Oregon Eastern, which is building the Southern Pacific's line from Natron, Ore., south to Klamath Falls, 142.6 miles, has increased its capital from \$1,000,000 to \$6,000,000, and plans have been made to build branch lines to various points in Oregon. It is understood that the line from Natron, in Lane county, east to Ontario in Malheur county on the Oregon Short Line is to be built, the latter company is re-

ported to have recently let a contract for an extension from Vale, Ore., west to Dog mountain, 135 miles. A branch is projected from a point on the Klamath Falls line, at or near that place to connect with the Central Pacific, and another branch is contemplated from the Ontario-Natron line south to Lakeview, which is eventually to be extended south to a point near the east shore of Goose lake, at the Oregon-California state line.

RAILWAY STRUCTURES.

ALLENTOWN, PA.—The Lehigh Valley Transit Company will build a large bridge at Allentown. The work is to be carried out by the Allentown & South Allentown Bridge Company, and it is understood that the structure will be built of concrete, and is to have a total length of about 2,000 ft., with 1,800 ft. between abutments.

BARSTOW, CAL.—The Atchison, Topeka & Santa Fe Coast Line has given a contract to C. A. Fellows at about \$65,000, it is said, for putting up a reinforced concrete 25-stall roundhouse at Barstow. (August 11, p. 305.)

CENTRALIA, WASH.—The contract recently let for building the new union station at Centralia for the Northern Pacific, the Great Northern and the Oregon-Washington Railway & Navigation Company has been given to the Rounds-Hurson Company, Seattle. It is understood that the contract price is about \$50,000. (December 22, p. 1301.)

CINCINNATI, O.—The city council has passed an ordinance granting a franchise to the Cincinnati Depot & Terminal Company for a union passenger terminal for all the steam and electric railways entering the city, and requiring its completion within five years. The plans include a large terminal office building, a new four-track entrance to the city, reducing the mileage and grades and an elevated approach. There is to be a meeting of railway officers on January 9 to consider plans for a building.

DENVER, COLO.—The six railways entering the city of Denver have decided to build a new union passenger terminal to cost about \$6,000,000 subject to approval by the various boards of directors of some details of plans.

LAREDO, TEX.—Work has been started on a new joint passenger station for the International & Great Northern and the Texas-Mexican.

LATHAM, ORE.—The Southern Pacific is planning to put up a new passenger station, it is said, at Latham.

MASON CITY, IA.—The Chicago, Rock Island & Pacific and the Chicago & Great Western will jointly build a union passenger station at Mason City. The estimated cost of the station is \$500,000.

MILNEBURG, LA.—The Railroad Commission of Louisiana has ordered the Pontchartrain Railroad, which is a subsidiary of the Louisiana & Nashville, to build a combined passenger and freight station at Milneburg within ninety days.

MONTRÉAL, QUE.—See Canadian Northern under Railway Construction.

RICHMOND, CAL.—The Atchison, Topeka & Santa Fe Coast Lines is having plans made for a reinforced concrete passenger station.

The chief feature of the railway policy in New Zealand is to connect up some isolated railway lines which extend only short distances inland from various small seacoast towns. When such detached lines are connected with the main lines, it will be possible for almost every town of importance to be reached by railway from the main centers of population and heavy through traffic with districts now reached only by coasting boats will be provided. It is also intended by construction already planned or under way to shorten the mileage and time for transportation between some leading towns. For instance, New Plymouth, about midway on the west coast, and Napier, about midway on the east coast, which now have good connection with Wellington and the southern part of the North island, will also be connected with the main trunk railway line between Wellington and Auckland at points much more northerly, giving access to Auckland without the present inconvenient roundabout routes.

Railway Financial News.

ATCHISON, TOPEKA & SANTA FE.—See Southern Pacific.

BOSTON & MAINE.—This company sold to William & Read & Co., New York, \$1,200,000 Fitchburg Railroad 4 per cent. currency bonds of 1912-1932 at 102.89. The bonds are being offered to the public by the bankers at 104. Of the proceeds of the sale, \$100,000 was used for refunding purposes and the remainder for additions and betterments made to the Fitchburg under its lease to the B. & M.

BUFFALO, ROCHESTER & PITTSBURGH.—This company has sold to Procter & Borden, New York, \$1,000,000 equipment trust certificates, series G, 1909-1929. The total authorized series G bonds amounts to \$3,000,000, and, including the bonds now sold, there are outstanding \$1,754,000, less \$44,000 retired through the sinking fund.

CENTRAL NEW ENGLAND.—This company has asked the New York Public Service Commission, Second District, for its approval of a supplemental mortgage to secure \$25,000,000 bonds, the bonds secured by the mortgage to be used to refund bonds of the Dutchess County Railway.

CHICAGO & NORTH WESTERN.—Stockholders of the Des Plains Valley Railway, a subsidiary of the North Western, has voted to authorize a mortgage securing \$2,500,000 bonds.

CLEVELAND & PITTSBURGH.—The New York Stock Exchange has listed \$1,073,950 special betterment stock. The stock was issued to pay for additions and betterments.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—The New York Stock Exchange has listed \$1,106,000 general mortgage 4 per cent. bonds, due 1993. Of these bonds, \$106,000 were issued for refunding purposes and \$1,000,000 for additions and betterments.

DES PLAINS VALLEY RAILWAY.—See Chicago & North Western.

DETROIT, TOLEDO & IRENTON.—The much postponed sale of this property has been again postponed from January 9 to April 9.

FITCHBURG RAILROAD.—See Boston & Maine.

FLORIDA RAILWAY.—A suit was recently filed by the Knickerbocker Trust Company, New York, against the Florida Railway for an accounting and compensation as trustee of the railway company's bonds. The railway company has now filed a counter claim for \$2,000,000 damages said to have been incurred through the unlawful refusal of the trust company to deliver bonds which it had certified to purchasers in Paris. It is claimed that as a result of this refusal the company has been without funds since August to continue extension work and that materials on hand are now worthless.

GRAND TRUNK PACIFIC.—Moleson Macpherson has been elected a director of the Grand Trunk Pacific.

KANSAS CITY, MEXICO & ORIENT.—It is said that arrangements have been made for the sale of an additional block of \$4,000,000 bonds.

MAINE CENTRAL.—That part of the St. Johnsbury & Lake Champlain running from the Connecticut river in Vermont to the village of St. Johnsbury, including the Victor branch, has been leased to the Maine Central, and will be operated as part of its line.

NEW YORK CENTRAL & HUDSON RIVER.—The New York Public Service Commission has authorized the New York Central & Hudson River to buy all or any part of the outstanding \$10,000,000 stock of the New York & Harlem, the price to be not higher than \$175 for a \$50 share.

The commission has given its permission to the issue of \$35,000,000 4 per cent. debentures at not less than 90, or \$30,000,000 notes at not less than 98½. The railway company's requests for authority were described in these columns last week.

NEW YORK & HARLEM.—See New York Central & Hudson River.

OLD COLONY RAILROAD.—There was sold at public auction on January 3 \$500,000 capital stock, making the total capital stock now outstanding \$21,664,000.

PENNSYLVANIA COMPANY.—The Toledo, Columbus & Ohio, all of whose stock is owned by the Pennsylvania Company, has declared an initial 6 per cent. annual dividend on its \$8,000,000 stock.

READING & COLUMBIA.—See Reading Company.

READING COMPANY.—Stockholders of the Reading & Columbia, a subsidiary of the Reading Company, have been asked to authorize \$850,000 new first mortgage 4 per cent. bonds of 1912-1962, to be guaranteed by the Reading Company, and the proceeds to be used to refund \$650,000 first mortgage 4 per cent. bonds, due March 1, 1912, and \$200,000 of the \$350,000 second mortgage 5 per cent. bonds, due September 1, 1912. The remaining \$150,000 second mortgage 5 per cent. bonds will be converted into debenture bonds.

SEABOARD COMPANY.—Stockholders of the Seaboard Company, which owns 83 per cent. of the Seaboard Air Line Railway stocks and \$6,785,000 of the railway adjustment bonds, voted unanimously to dissolve the company by retiring the first preferred stock for cash at par, exchanging for the second preferred stock 1½ shares of the railway company preferred stock, for each share outstanding, and for the common stock slightly over par in common stock of the railway. The adjustment mortgage bonds were recently sold by the holding company to provide for this dissolution.

SOUTHERN PACIFIC.—This company has, it is understood, bought from the Atchison the Sonora Railway and the New Mexico & Arizona and the Atchison has bought from the Southern Pacific the line between Mojave and the Needles in California.

The Atchison has organized the California, Arizona & Santa Fe with a capitalization of \$50,000,000 to consolidate the Mojave-Needles line with the Arizona-California line from Bengal, Ariz., to Wickenburg, on the Santa Fe, Prescott & Phoenix, a distance of about 195 miles.

Atchison directors and officers have resigned from the New Mexico & Arizona and Sonora Railway, Limited, and Southern Pacific directors and officers have been elected. The New Mexico & Arizona line runs from Benson, Ariz., on the Southern Pacific, south to Nogales on the Arizona-Mexico border, a distance of about 80 miles. The Sonora line runs from Nogales on the south through Mexico to Guaymas on the Gulf of California, and is 263 miles long. The line from Mojave to Needles in California is 243 miles long and has always formed part of the Atchison's through line. Since 1885 it has been leased to the Atchison at an annual rental of \$163,850. This rental has been offset by payment of the same amount annually by Southern Pacific for use of the Sonora line.

ST. JOHNSBURY & LAKE CHAMPLAIN.—See Maine Central.

TOLEDO, COLUMBUS & OHIO.—See Pennsylvania Company.

WESTERN MARYLAND.—This company has authorized an issue of \$10,000,000 secured 5 per cent. notes of 1912-1915, of which \$8,000,000 have been sold. The notes are secured by all of the capital stock of the Georgia's Creek & Cumberland and of the Connellsburg & State Line Railway, which companies own the 85-mile line running from Cumberland, Md., to a connection with the Pittsburgh & Lake Erie at Connellsburg, Pa. This line is not covered by any mortgage. The proceeds of the notes are to be used for additions and betterments.

The Russian railways examination committee has received a report on the investigations carried out on the Siberian railway. It reports that the total cost of equipping the railway after finishing its partial reconstruction will make about \$110,000 per mile. Taking into account the facilities for receiving and discharging traffic and the difficulties in working, the estimate is considered moderate. The operation of the Siberian railway is carried out very satisfactorily on the whole, and improvements are to be wished for only in respect to the organization of the work in constructing the second line, the quality of the rails, the control of supplies of material and the calculations as to working capital, the organization of the commercial sections and the infirmary department.